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PANASONIC

LOGIC ANALYZER

VP-3620A

PANASONIC

SERVICE MANUAL

GENERAL ELECTRIC
INSTRUMENTATION & COMMUNICATION
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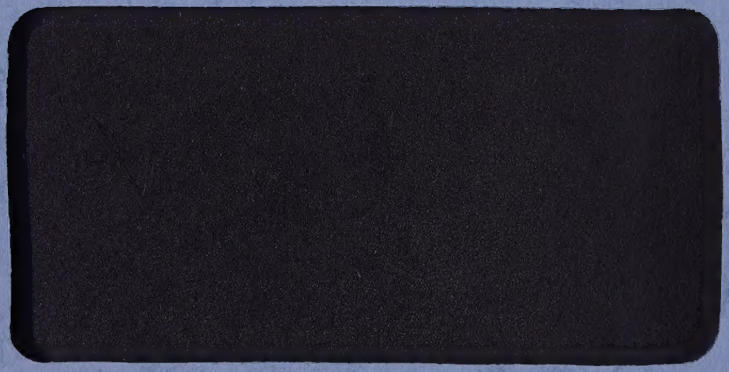

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SERVICE MANUAL

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When using this service manual, refer to the Operation Manual for the product specifications and the operating procedures.

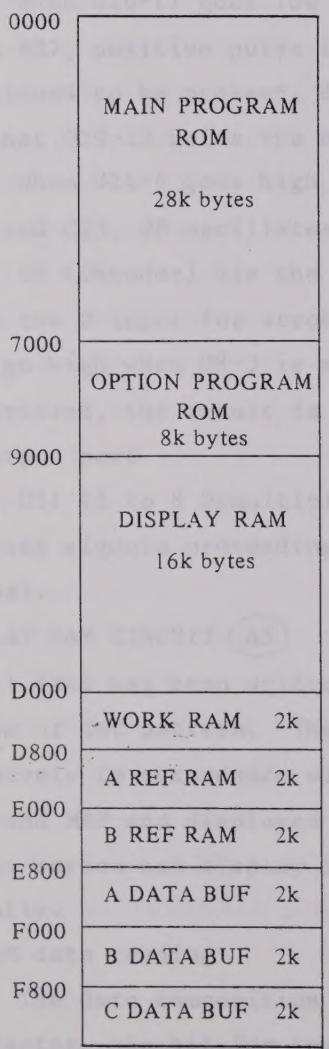
1. CIRCUIT DESCRIPTION

1. CPU CIRCUIT (A2)

This circuit decodes successively the main program loaded in the ROM with U61 (CPU 8085) and sends the data as the control signal to various sections for execution of the instruction.

As the IN, OUT or other instruction is executed in accordance with the keyboard control, the associated circuits are controlled for operation via the input or output port designated by the port No.

(1) MEMORY MAP



(2) Input port

The U21 (Keyboard/Display Controller) is the keyboard switch input interface LSI. The output data (DBO thru DB7) is transmitted to the CPU according to the input data (RTO thru RT7) from the keyboard.

The circuit formed by U29 (Retriggerable Single Shot) and U8 (Timer) causes the setting conditions and cursor to work as if the keyboard switch EDIT, CURSOR, "1", "0" or X were pressed repeatedly continuously when the switch is actually held down continuously.

When U26-11 goes low upon data input of RT4 thru RT7 and RX5 thru RX7, positive pulse is output from U29-13. When the key is continued to be pressed, U26-11 continuously outputs negative pulse so that Q29-13 holds the high level.

When U24-6 goes high after elapse of the time that depends on R24 and C23, U8 oscillates with the time constant of R3, R2 and C3.

U6 (Decoder) has the input code applied to A, B and C only and uses the D input for strobe so that the output data (RX0 thru RX7) all go high when U8-3 is at the low level. Hence, even if the key is pressed, the result is same as when it is off.

(3) Output port

U31 (3 to 8 Demultiplexer) and SN74S138 (10 in all) decode the address signals proceeding from the CPU to generate the chip select signal.

2. DISPLAY RAM CIRCUIT (A3)

All data has been written in U21 thru U28 RAM of this circuit in the form of dot pattern. The written data is read from U21 RAM successively in accordance with the display format of MENU, STATE, TIMING and MAP and displayed on the CRT screen from top downward.

The screen can display 50 characters laterally and 35 characters vertically.

(1) RAM data reading

The data composition of U21 thru U28 (RAM) is 6 bits for one character, one bit for inverted display information and one unused bit per each byte.

To U74-1 is input the H pulse in the display section of one horizontal axis scan (50 characters) and to U74-2 is input the H pulse at every character (6 bits) during one scan.

Accordingly, U45 counts up at every character in one scanning line and consequently, one byte of RAM data is output at every character during one scan cycle of the horizontal axis by $\overline{DA0}$ thru DA10 address lines of U45 and U46.

As for the selection of the eight RAMs U21 thru U28, the output DA11 thru DA13 of U46 is switched by U42 decoder (DS0 thru DS7) at every 2 KW.

U41, U62, U44, U43 and U63 provide 2 to 1 data selection and when RAM is read, they are controlled by the U53-8 instruction pulses to insure selection of all A pins.

(2) RAM data parallel input and serial output

The data output from the RAM is led through U66 (Busbuffer) to U47, U48 (Shift register). The first data is loaded in U47 by U75-8 L pulse. The loaded data is output from U47-9 as the serial data while the next RAM data is being loaded in U48 by U75-6 L pulse.

After 6 bits of data are output from U47-9, U48-15 inhibit is cancelled and the data loaded in U48 is output from U48-9 as the serial data.

The display inversion information is loaded in U49, U50 shift register.

(3) Z axis signal output

The timing to output the Z axis signal is determined by the output signal of U18-3. To U18-1 is input H level signal from the first character to 50th character of the H axis and to U18-2 is input H level signal from the first scanning line to the 315th scanning line. Accordingly, U18-3 is at the low level up to the 50th character of one scanning line and up to the 315th scanning line.

The output of U18-3 is applied to U52-12 and after masking of one character, U34 synchronizes it with the reference clock signal and it is output as the Z axis signal from U74-8.

(4) RAM capacity vs. display region

Total 16 K byte (2 K byte x 8) RAM is mounted.

As 50 bytes (50 characters) are required for every scanning of the horizontal axis, each RAM (2,048 bytes) has a capacity for 41 scanning lines (2,048/50).

Accordingly, the number of RAMs required for scanning 315 lines in the display area is 8 in total (315/41).

3. INPUT CIRCUIT (A4)

This circuit gathers the 8 channel data input to the probe B (B-0 CH thru B-7CH) and the 8 channel data input to the probe A (A-0CH thru A-7CH) in either the SAMPLE or LATCH mode.

The gathered data is sent out as the SAMPLE signal, GLITCH signal or GLITCH TRIGGER signal.

(1) SAMPLE mode

The probe B is placed in the SAMPLE mode when INP 1 (P1-66) is at the H level and the probe A is placed in the SAMPLE mode when INP 2 (P1-64) is at the H level. In the following, explanation is given for the probe B-0CH.

The input data of the probe B-0CH is led through U16 (Four stages of inverters) and U39 (Data selectors) and latched to U49 (D-FF).

The input data is latched at the rise of the clock (CKB 0).

(2) LATCH mode

The glitch mixed in the input data can be detected in the LATCH mode. The probe B is placed in the LATCH mode when INP 1 (P1-66) is at the L level and the probe A is placed in the LATCH mode when INP 2 (P1-64) is at the L level. Explanation is given in the following for the probe B-0CH.

The input data of the probe B-0CH is led through U16-2, U16-12 (Inverters) and caught by U28 (FF). It is then led through U39 (Data selectors) and latched to U49 (D-FF).

Mixture of glitch in the input data causes U28 (FF) to invert. The inverted result is latched to U49 (D-FF) at the rise of the clock (CKB 0) and at the same time, the output of U49 ($Q.\overline{Q}$) is fed back to U28-2, U28-12 to reset U28 (FF).

At the next clock (CKB 0), U49 (D-FF) can again latch the input data so that the glitch is caught as the signal for one clock.

(3) GLITCH TRIGGER

The input data is removed and only the glitch is detected and sent out to the MEMORY circuit (A5) as the GLITCH TRIGGER signal. Explanation is given in the following for the probe B.

From the output of U49 (D-FF) and U59 (D-FF), the glitch signal corresponding to one clock is taken and expanded to the glitch signal for two clocks by U69 (EX-OR). Then, by reducing the 2-clock glitch signal into one-clock glitch signal by U67 (D-FF) and U66 (AND GATE), the input data is removed.

When the GLITCH TRIG is designated for the probe B CH 0 by the MENU, U57-10 (GS17) goes high. U35 (D-FF) detects only the glitch signal that has been reduced for one clock and outputs it to U35-5 (TG G) as the GLITCH TRIGGER signal.

4. MEMORY CIRCUIT (A5)

The data proceeding from the probe B and A (INPUT circuit) and the probe D and C (CLOCK DISTRIBUTOR circuit) is stored in the MEMORY (RAM 1K words).

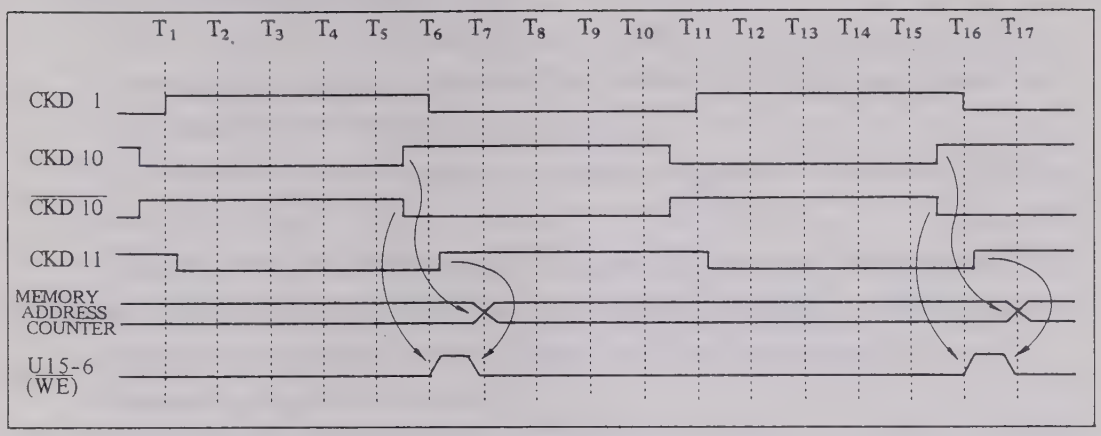
The ADDRESS COUNTER for adressing the RAM and the CLOCK DELAY COUNTER and EVENT DELAY COUNTER designated with the TRACE MENU are provided.

(1) DATE MEMORY and MEMORY ADDRESS COUNTER

The memory and address counter division of each probe channel is as follows:

	DATE MEMORY	ADRS COUNTER
PROBE D	U27, U37	U5, U6, U16
PROBE C	U26, U36	
PROBE B	U29, U39	U8, U9, U19
PROBE A	U28, U38	U7, U17, U18

The memory write signal $\overline{WE}$ is output at the timing shown below. $\overline{WE}$ is produced by NOR of CKD11 and $\overline{CKD11}$. Accordingly, $\overline{WE}$ is generated approximately 10 s before switching of the memory address regardless of the clock frequency.



$\overline{WE}$ timing chart

When U11-6 (TGD4) is at the H level, the MEMORY ADDRESS COUNTER counts the input pulses of U15-6 (CKD10) and it stops when the level is low.

(2) DELAY COUNTER

The DELAY COUNTER gives the triggering condition for determining the number of TRACE data to be stored. The DELAY COUNTER circuit composition is as follows:

1 CLOCK DELAY COUNTER

PROBE D and C: U13, U14, U23 and U24

PROBE A: U53, U54, U63 and U64

2 EVENT DELAY COUNTER: U33, U34, U43 and U44

For loading to each counter, the decimal number set in the MENU is converted into binary by the CPU and its complement is preset on the counter.

When the preset complements for all of 16 bits are reduced to zero by the clock pulse input, U3 and U4 (JK-FF) are set and the MEMORY ADDRESS COUNTER is stopped.

Upon stopping of the DELAY COUNTER, both the synchronous and asynchronous sections complete the measurement and $\overline{WE}$ goes high. Then, the READ CLOCK (1024 pulses) is sent from the CPU and the measured data is transferred to the BUFFER RAM.

The first pulse of this READ CLOCK resets U3 and U4 (JK-FF), enabling the MEMORY ADDRESS COUNTER again.

5. CLOCK DISTRIBUTOR CIRCUIT (A6)

This circuit is so composed as to make the following operations.

- To sample the input data from the probe D, C (CH1 thru CH16) and the probe E (DQ1, DQ2).
- To clock-qualify the input data from the probe E (EXT CK1, EXT CK2, CQ1, 2, 3, 4).
- To distribute the MASK signal to prevent writing of incorrect date and triggering with incorrect data when starting the measurement.
- To set the threshold voltage with the D/A converter and to distribute it to each probe.

(1) Input data sampling

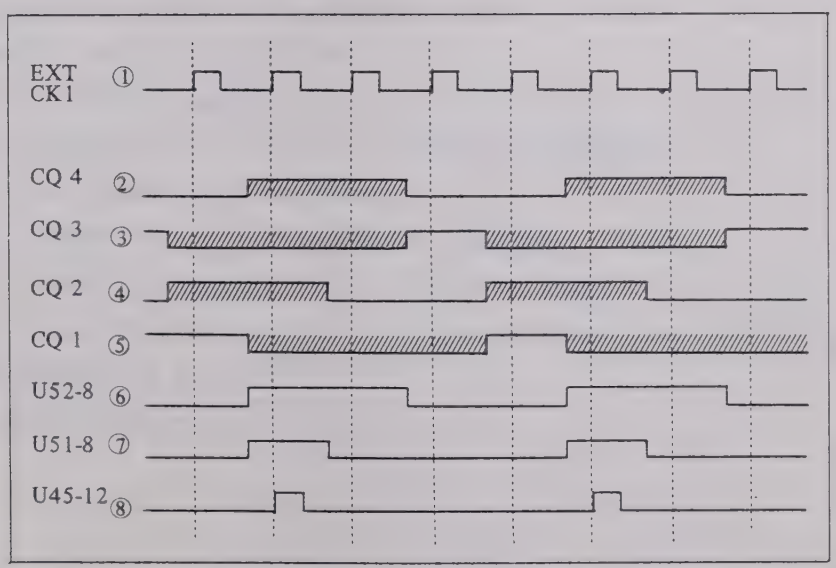
The input data of the probe D and C (CH1 thru CH16) and the probe E (DQ1, DQ2) is sampled to U59 U58 (D-FF) and U19 (D-FF).

The sampled data output (LD1 thru LD16, LDQ1, LDQ2) is used to detect the TRIGGER signal.

The data output to the MEMORY circuit (SD1 thru SD16) is latched to U69, U68, U67 to match timing with the data output (SD17 thru SD32) of the INPUT circuit.

(2) EXT CLOCK and CLOCK QUALIFIER

When the MENU is set as EXT 1 = +, CQ4 = 1, CQ3 = 0, CQ2 = 0, CQ1 = 0, the timing of the output signals of U45-12 becomes as shown below.



(3) CLOCK operation

The operating condition of each circuit is set with the timing of clocks (CLK) T1 and T2 proceeding from the CPU. When positive pulse of approx. 150 mS arrives at RESET 1 and then the level goes low, U14-14 (CLR) goes high to enable U14 (JK-FF). At the same time, the clock (CLK) being output from U15-8 is stopped.

Then the output pulse of U24-8 is input to U14-13 (CK) at the timing of the clock (CLK) T3 and T4, U14-9 (Q) goes high and the external clock (CKD 0) is sent from U15-8 to various sections, starting the measurement.

During the measurement, the external clock is sent out at all times.

In case the measurement is stopped with clock (CLK) T10 and T11, the $\overline{\text{DA DL}}$ line goes low and U15-8 stops the external clock (CKD 0) and goes low.

When the $\overline{\text{DA DL}}$ line goes low, 1024 pulses are sent to the $\overline{\text{READ CK}}$ line and the measurement DATE latched to U69, U68, U67 (D-FF) is transferred to the MEMORY circuit.

In the TRACE MODE, the clocks are output as shown below.

1 U24-8 (CKD 0) output

. TRACE MODE 16 + 16(1) and TRACE MODE 32
  Inverse phase clock of U45-12
. TRACE MODE 16 + 8 + 8 and TRACE MODE 16 + 16(2)
  Inverse phase clock of U54-11

2 U34-8 (CKB 0) output

. TRACE MODE 16 + 8 + 8, 16 + 16(2) and TRACE MODE 32
  Inverse phase clock of U45-12
. TRACE MODE 16 + 8 + 8 and TRACE MODE 16 + 16(2)
  The probe B is set at EXT 1. Inverse phase clock of U54-6
  The probe B is set at EXT 2. Inverse phase clock of U54-80
. TRACE MODE 16 + 16(1)
  Inverse phase clock of INT CK

3 U44-8 (CKA 0) output

. TRACE MODE 16 + 16(2) and TRACE MODE 32

Inverse phase clock U45-12

. TRACE MODE 16 + 16(2)

The probe B, A are set at EXT 1. Inverse phase clock of U54-6.

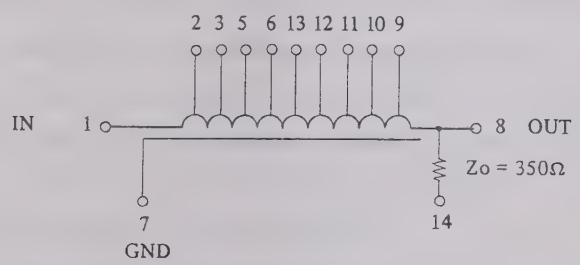
The probe B, A are set at EXT 2. Inverse phase clock of U54-8.

. TRACE MODE 16 + 8 + 8 and TRACE MODE 16 + 16(1)

Inverse phase clock of INT CK

(4) DELAY LINE (DL1, DL2, DL3)

The DELAY LINE delays the clocks (CKD 0, CKB 0, CKA 0) by the time required to match the clock operation timing of each circuit before they are distributed to each circuit.



Pin No.	1	2	3	5	6	13	12	11	10	9	8
Delaytime (nS)	0	5	10	15	20	25	30	35	40	45	50

(5) D/A CONVERTER (U42, U32, U22)

The threshold voltage set in the MENU is converted from the digital value to the analog value before it is fed to each probe. The 8-bit data (DAD 0 thru DAD 7) to the D/A converter takes the following form according to the set voltage.

Set voltage	DAD 0	1	2	3	4	5	6	7
+6.35 V	1	1	1	1	1	1	1	1
+6.30 V	0	1	1	1	1	1	1	1
+6.25 V	1	0	1	1	1	1	1	1
⎛ ⎞								
-6.35 V	0	0	0	0	0	0	0	0

6. TRIGGER DETECTOR CIRCUIT (A7)

This circuit detects the trigger in each TRACE MODE according to the data of a total of 34 channels, namely the data qualifier (LDQ1, LDQ2) and sampling data (LD1 thru LD32) supplied from the INPUT circuit and the CLOCK DISTRIBUTOR circuit.

The circuit comprises the FILTER circuit to prevent misdetection of the trigger signal due to glitch, etc. and the CLOCK generator circuit to get the frequency set in the MENU.

(1) Detection of trigger signal

The trigger signal is detected when the trigger word set in the MENU agrees with the sampling data. Explanation is given in the following for the sampling data LD1 thru LD4.

To 1A thru 4A of U69 (Data selectors), the data (AB0 thru AB3) of trigger word set in the MENU is being input. To 1B thru 4B, the sampling data (LD1 thru LD4) of the probe D is being input.

When the RUN key is pressed, RESET 1 goes high (pulse =150 mS) and U69 1A thru 4A input is output to 1Y thru 4Y. High level is written in the memory (U39-D0 thru D3).

When RESET 1 goes low upon end of the pulse, U69 1B thru 4B input is output to 1Y thru 4Y. Accordingly, U39 is adressed with the sampling data and when $\overline{WE}$ (U39-3) goes high, the memory data (U39-O0 thru O3) is output.

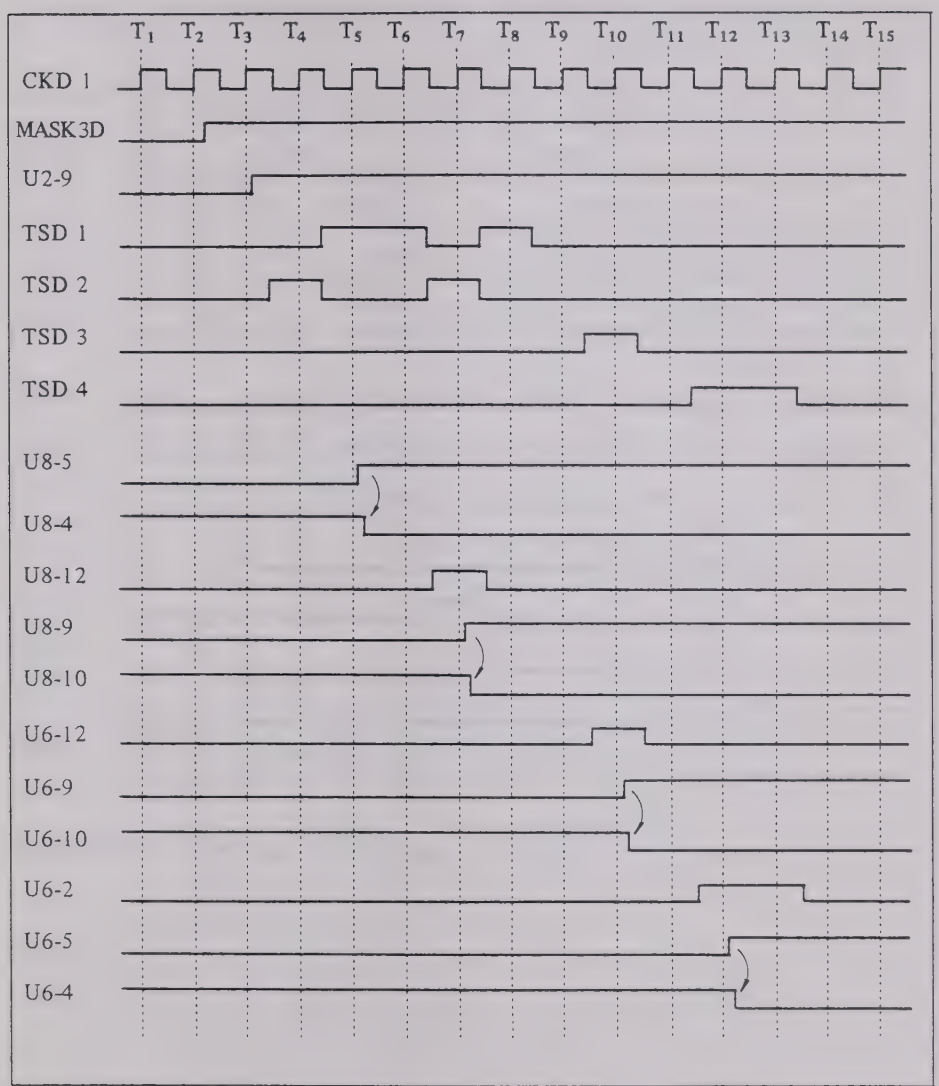
(2) SEQUENTIAL TRIGGER signal

The detected trigger signals (TSD1 thru TSD4) are output regardless of the set condition. Operation takes place in such a manner that the trigger signals (TGD1 thru TGD4) are output in the order of 4-level sequential trigger set in the MENU.

The sequential trigger of this equipment has U7-3 (AND) and U2-11 (D-FF) to edge-trigger the first level. If the first level is all xxxx and no edge is generated, U54 (OR GATE) insures triggering.

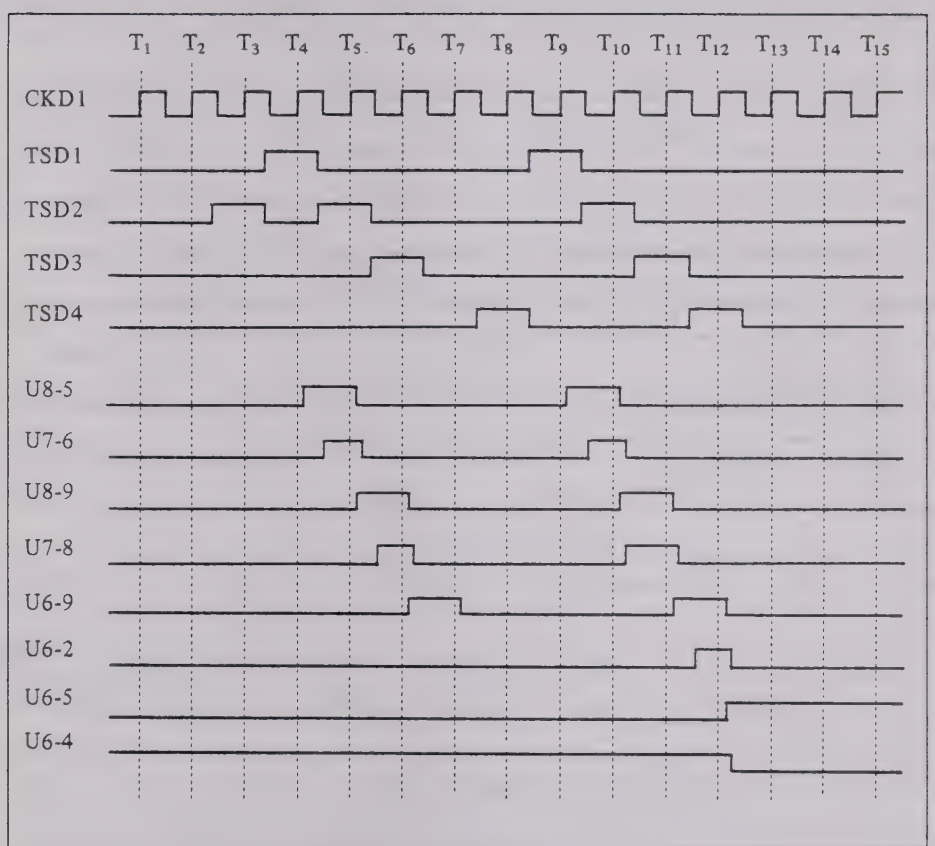
COMB 1 . 2 . 3 . 4

As for U8 and U6, if the clock pulse CKD1 arrives when the input TSD is at the high level, Q goes high to preset it.



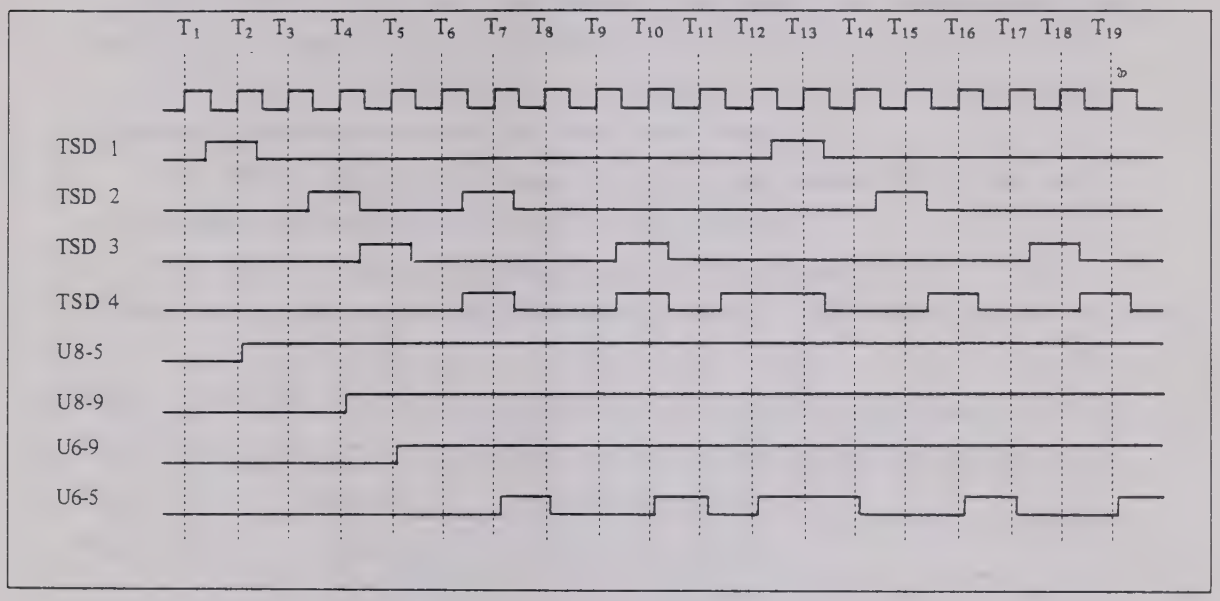
COMB 1 . 2 . 3 . 4

U8 and U6 operate as the shift register since the $\overline{1.2.3.4}$ signal goes low.



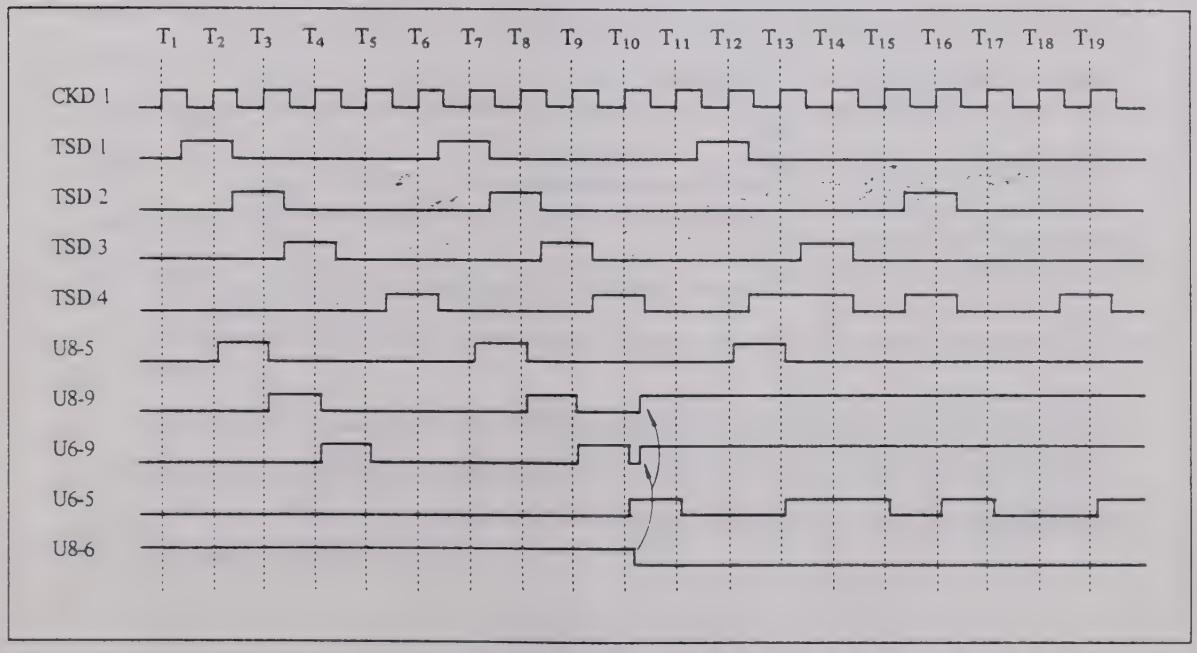
TRACE 1 x 2 x 3 x 4

U6-4(P) is not preset since the $\overline{\text{TRACE}}$ signal goes low. After detection of TSD1 thru TSD3, U6-5(Q) outputs the TSD4 signal at all times.



TRACE 1 . 2 . 3 . 4

$\overline{\text{TRACE}}$ signal = L level, $\overline{1.2.3.4}$ signal = L level.



(3) FILTER

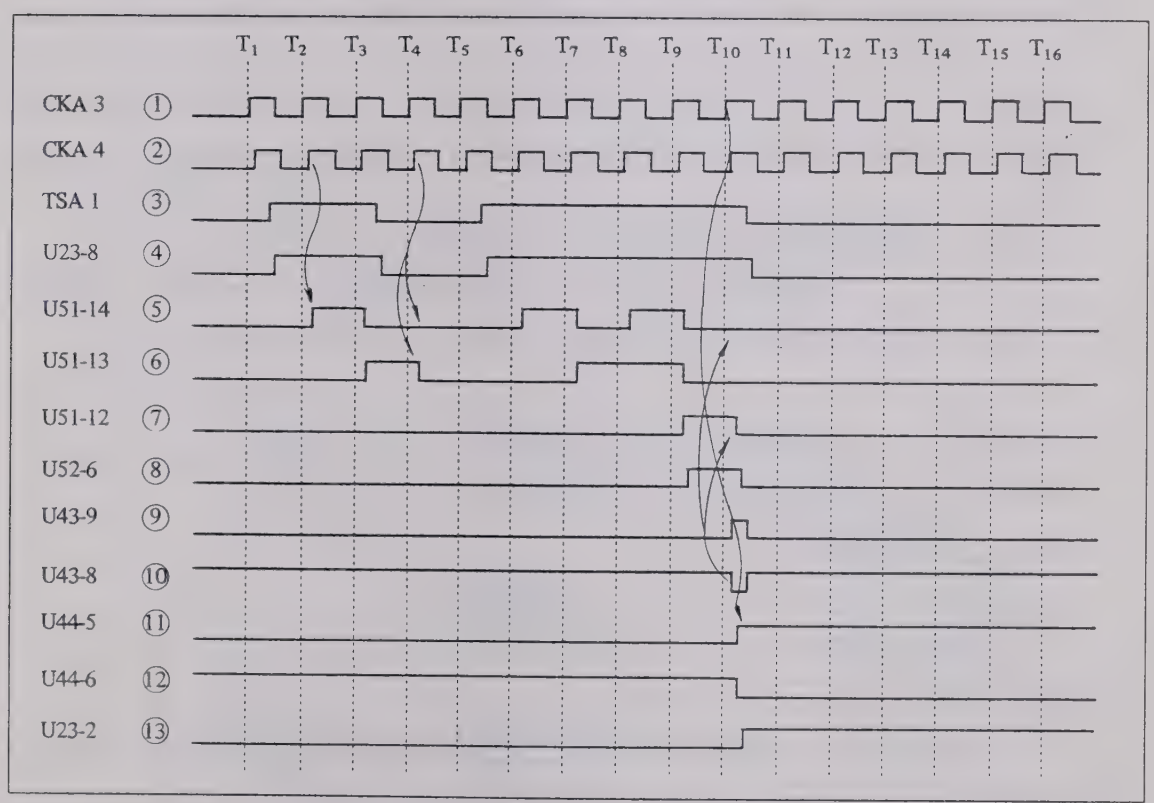
If the trigger word continues for more than the number of clocks set with the FILTER CLOCKS of the MENU, the trigger signals (TGA1 thru TGA4) are output.

U23 (AND -OR-INV) is the selector for selecting successively the sequential trigger levels 1 through 4.

U51 (4-bit Counter)counts the number of clocks while the trigger is being input and outputs the data to Q0 thru Q3.

U42 (D-FF) latches the input data of the number of filters set in the MENU and outputs the data to Q1 thru Q4.

U52 (4-bit Comparator) goes high at U52-6 when A = B.



(4) CLOCK

There are two types of sampling clocks, i.e. the internal clock generated by the CLOCK GENERATOR and the external clock input from the probe E, either of which is selected according to the designation of the TRACE MODE.

The internal clock is usable from 50 nS to 50 mS in 1.2.5 steps and the external clock is usable from DC to 20 MHz.

Clock Generator Operation

The internal clock is generated by U41 20 MHz X'tal oscillation.

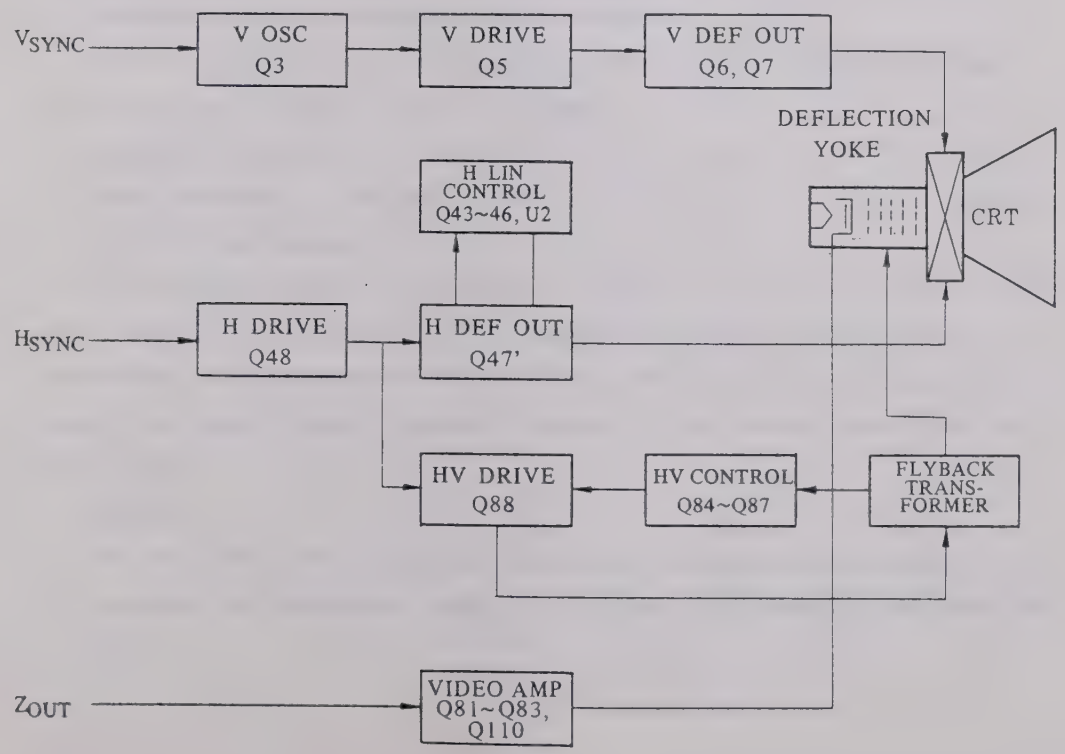
U21 (JK-FF), U1, U11, U12 (Decade counter), U22 (80 to 1 Data selector), U61 (4 to 1 Data selector) and U32 (D-FF) latch the data for selecting the frequency set in the MENU and the output Q1 thru Q5 of U32 is as follows:

	nS				μS									mS					
	50	100	200	500	1	2	5	10	20	50	100	200	500	1	2	5	10	20	50
U32- 2 [INT 1A]	0	1	1	1	0	0	0	1	1	1	0	0	0	1	1	1	0	0	0
U32- 5 [INT 1B]	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	1	1	1
U32- 7 [INT 1C]	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1
U32-10 [INT 2A]	0	0	1	0	0	1	0	0	1	0	0	1	0	0	1	0	0	1	0
U32-12 [INT 2B]	0	0	0	1	0	0	1	0	0	1	0	0	1	0	0	1	0	0	1

7. CRT DISPLAY (A10)

This circuit displays MENU, TIMING, STATE, MAP1 or MAP2 on V1 (CRT) according to the Vsync, Hsync, and Zout signals.

The circuit operation of each section is as shown in the block diagram below.



8. KEYBOARD (A11)

Upon input of the external clock (EXT 1, EXT 2), U1 (Retriggerable single shot) is triggered by the rise edge of the clock to output approx. 150 mS pulse at U1-Q and this causes DS1, DS2 (LED) to light.

Q1 is the driver to light BLANK, REP/SING, RUN/STOP and ERROR LEDs.

9. POWER (A12)

The power circuit of this equipment is a DC-DC converter system under switching regulator control, that does not use transformer but directly rectifies the commercial power to give constant voltage regulated power.

(1) Rectification of commercial power

This equipment can be operated by either 100 V AC or 200 V AC line according to the rectification system selected with S1.

When operating on 100 V AC line, voltage doubler rectification is adopted and when operating on 200 V AC line, full wave rectification is adopted. In this manner, DC output of nearly the same voltage is obtained regardless of the line voltage.

The voltage tolerance of the commercial power is as follows:

- 100 V AC line: 90 V to 126 V (100 V - 10 % to 115 V + 10 %)
- 200 V AC line: 180 V to 250 V (200 V - 10 % to 230 V + 9 %)

(2) Constant voltage regulated power supply

The output voltage and load current of the constant voltage regulated power supply are as follows:

. Output voltage:	+5 V	-5 V	-12 V	+18 V	+20 V
. Load current: (With five probes)	Approx. 10A	0.5 A	0.5 A	1.5 A	0.1 A

For regulation of the output voltage, fluctuation of the +5 V power supply is detected by U51 (Comparator) and is fed back to U1 (Switching regulator control) via RT2 (Photocoupler). This makes the output voltage constant against change in the output waveform duty of U1-12 and U1-13.

CAUTION

- Do not short the equipment chassis to secondary side GND. The primary and secondary sides of T2 are electrically insulated by RT2.

. When operating the power unit alone, connect all loads to the constant voltage power supply output. Otherwise, abnormal rise of the output voltage could cause damage to the smoothing electrolytic capacitors.

(3) U1 (Switching Regulator Control)

U1-15 (Vcc) is supplied with 9 V to 15 V from Q1, Q2 switching power supply operating on 8 to 16 V. R31 and C32 set the oscillation frequency. C34 provides soft starting when power is turned on. R40 is the overload detection resistor.

10. PROBE (A14)

Four VQ-059A20 and one VQ-059A20E are used as the input probes. The circuit boards for these two types of probes are identical.

The input signal has its level reduced to 1/3 by R1, R2 and R3 attenuators. The threshold voltage is also supplied at a reduced level (1/3 of the set level). This is to take account of the input voltage operating range of U1 (Comparator).

The threshold voltage is branched in two and applied to the probe E. For the probes A thru D, the voltage is made common within the unit itself.

CR1 and CR2 are the protective diodes against positive and negative overvoltage, respectively.

R6 is a variable resistor to adjust the dual FET V_{GS} to the same level.

R4 and R8 are the resistors to prevent oscillation.

U1 sends the output signal of the same phase as the input signal to the unit and U81 sends the inverted output signal to the unit through twist pair cable.

11. DESCRIPTION OF SIGNAL SYMBOLS USED IN CIRCUIT DIAGRAM

A	
A AUTO	When 1 of the asynchronous section sequential trigger is all x, it goes high ("1").
A EX 1	Goes high when the BA side clock is EXT 1 in the TRACE MODE 16 + 16(2). Low when TRACE.
A EX 2	Goes high when the BA side clock is EXT 2 in the TRACE MODE 16 + 16(2). Low when TRACE.
A EXP	When the BA side clock is EXT 1 in the TRACE MODE 16 + 16(2), goes low if EXT 1 + and goes low if EXT 1-.
$\overline{\text{A DL}}$	Goes low when the asynchronous section delay is completed or the STOP key is pressed.
A MASK	Masks the data that is written in the memory first when the RUN key is pressed. Goes high during masking.
$\overline{\text{A TG}}$	Goes low when D.C section is BA TRIG or A TRIG.
AW 1	MEMORY WRITE ENABLE signal of section A.
B	
B EX 1	Goes high when TRACE MODE 16 + 8 + 8 section B or 16 + 16(2) BA side clock is EXT 1 and low otherwise.
B EX 2	Goes high when TRACE MODE 16 + 8 + 8 section B or 16 + 16(2) BA side clock is EXT 2 and low otherwise.
B MASK	Masks the data that is written in the memory first when the RUN key is pressed. High during masking.
BW 1	MEMORY WRITE ENABLE signal of section B.
C	
CKA	Operation clock of section A CKA0 thru CKA10 (0 thru 10 is 50 nS delay).
CKB	Operation clock of section B.
CKD	Operation clock of sections D and C.
D	
DAA ___	Probe A threshold voltage setting. LSB when DAA is 0 and MSB when DAA is 7. All low when setting is -6.35 V and all high when +6.35 V.

DAB ___	Probe B threshold voltage setting. Same as above otherwise.
DAD ___	Probe D.C threshold voltage setting. Same as DAA otherwise.
$\overline{\text{DA DL}}$	Goes low when both synchronous and asynchronous section delay is completed or when the STOP key is pressed.
$\overline{\text{D DL}}$	Goes low when asynchronous section delay is completed or the STOP key is pressed.
$\overline{\text{DC TG}}$	Goes low when the TRACE MODE 16 + 8 + 8 section A and 16 + 16(1) section BA are DC TRIG.
D EX P	Low when the DC section clock is EXT 1+ and high when it is EXT 1-.
D MASK	Masks the data that is written in the memory first when the RUN key is pressed. Goes high during masking.
DW 1	MEMORY WRITE ENABLE signal of section D.
E	
$\overline{\text{EVENT}}$	High only when the EVENT DELAY setting of the section DC is zero.
EX 2P	Low when the TRACE MODE 16 + 8 + 8 section B or 16 + 16(2) section BA is EXT 2+ and high when it is EXT 2-.
G	
$\overline{\text{GT TG}}$	Low when GLITCH TRIG is set in the TRACE MODE 16 + 8 + 8 section A or 16 + 16(1) section BA TRIGGER.
GS 17 thru GS 32	GS is the GLITCH TRIG channel designation. When G is set with GLITCH TRIG, the designated channel goes high. The relationship between the probe and GS is B-0CH for GS17, B-7CH for GS24, A-0CH for GS25 and A-7CH for GS32.
H	
HCC 1	High when 1 is set in CLOCK QUALIFIER CQ1 and low when 0 or X is set.
HCC 2	Same as HCC 1 except that CLOCK QUALIFIER is CQ2.
HCC 3	Same as HCC 1 except that CLOCK QUALIFIER is CQ3.
HCC 4	Same as HCC 1 except that CLOCK QUALIFIER is CQ4.
H EN	Intended for future model and not need by VP-3620A.

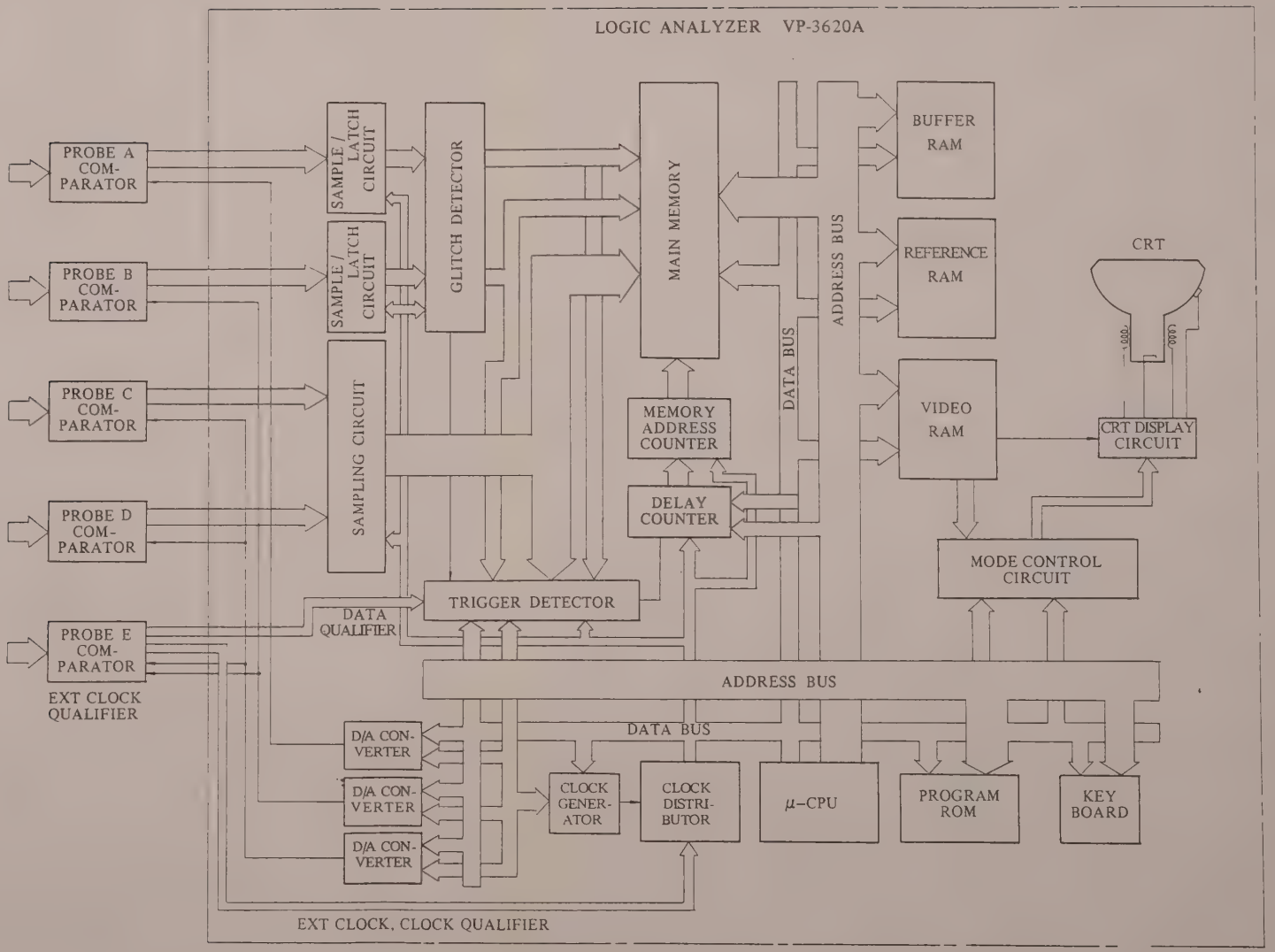
H TG	Intended for future model and not need by VP-3620A.
H R/W	"
H SYNC	Horizontal axis sync signal to CRT display PC board.
H SYNC V	Horizontal axis sync signal to video printer.
I	
INP 1	Low when the TRACE MODE 16 + 16(1) section B INPUT mode is SAMPLE and high when LATCH. Unless 16 + 16(1), always low.
INP 2	Low when section A INPUT mode is SAMPLE in the TRACE MODE 16 + 8 + 8 or 16 + 16(1) and high when LATCH. Low if 16 + 16(2) or 32CH.
INT CK	Internal clock used in the asynchronous section.
INT 1A INT 1B INT 1C INT 2A INT 2B	These five instructions are for internal clock selection. They take the following levels according to clock setting.

	nS				S									mS					
	50	100	200	500	1	2	5	10	20	50	100	200	500	1	2	5	10	20	50
INT 1A	L	H	H	H	L	L	L	H	H	H	L	L	L	H	H	H	L	L	L
INT 1B	L	L	L	L	H	H	H	H	H	H	L	L	L	L	L	L	H	H	H
INT 1C	L	L	L	L	L	L	L	L	L	L	H	H	H	H	H	H	H	H	H
INT 2A	L	L	H	L	L	H	L	L	H	L	L	H	L	L	H	L	L	H	L
INT 2B	L	L	L	H	L	L	H	L	L	H	L	L	H	L	L	H	L	L	H

L	
LCC 1	Low when 1 is set in CLOCK QUALIFIER CQ1 and high when 0 is set. Low if X is set.
LCC 2	Same as LCC 1 except that CLOCK QUALIFIER is CQ2.
LCC 3	Same as LCC 1 except that CLOCK QUALIFIER is CQ3.
LCC 4	Same as LCC 1 except that CLOCK QUALIFIER is CQ4.
M	
MASK___	Signal to mask each circuit to prevent writing of unnecessary data or triggering with incorrect data until the data is started to be written in the memory upon depression of the RUN key.

MODE 1	Means TRACE MODE 16 + 8 + 8.
MODE 2	Means TRACE MODE 16 + 16(1).
MODE 3	Means TRACE MODE 16 + 16(2).
MODE 4	Means TRACE MODE 32.
R	
$\overline{\text{READ CK}}$	1024 pulse clock for transferring the measurement data written in the memory to the buffer memory after the measurement is completed (synchronous and asynchronous sections).
$\overline{\text{READ CK A}}$	Not used by VP-3620A.
RESET 1	Approx. 150 mS reset pulse for initialization.
RESET OUT	Reset signal for RESET IF, etc. Connected to the RESET terminal on the rear panel. Negative logic.
S	
$\overline{\text{STOP}}$	Negative pulses to forcibly stop the measurement when the RUN/STOP key is pressed during a run.
T	
$\overline{\text{TG A1}}$	Goes low when the 1st level trigger word of the asynchronous section SEQUENTIAL. TRIGGER is detected.
$\overline{\text{TG A2}}$	Same as $\overline{\text{TG A1}}$ except that the level is the second level.
$\overline{\text{TG A3}}$	Same as $\overline{\text{TG A1}}$ except that the level is the 3rd level.
$\overline{\text{TG A4}}$	Same as $\overline{\text{TG A1}}$ except that the level is the 4th level.
$\overline{\text{TG A}}$	Goes low when the asynchronous section trigger setting condition are met (i.e. detection of 4th level in the case of SEQUENTIAL and detection of GLITCH in the case of GLITCH trigger).
$\overline{\text{TG D1}}$	Goes low when the 1st level trigger word of the synchronous section SEQUENTIAL TRIGGER is detected.
$\overline{\text{TG D2}}$	Same as $\overline{\text{TG D1}}$ except that the level is the 2nd level.
$\overline{\text{TG D3}}$	Same as $\overline{\text{TG D1}}$ except that the level is the 3rd level.
$\overline{\text{TG D4}}$	Same as $\overline{\text{TG D1}}$ except that the level is the 4th level.

TG A OUT	Goes low when the 4th level trigger word of the asynchronous section SEQUENTIAL TRIGGER is detected.
TG D OUT	Goes low when the 4th level trigger word of the synchronous section SEQUENTIAL TRIGGER is detected. In the case of TRACE, goes low only while the set trigger word is being detected.
TG G	Goes high upon triggering after detection of GLITCH by the GLITCH trigger.
TG R4	Goes high when the 4th level trigger word of the synchronous section SEQUENTIAL TRIGGER is detected. This signal is an optional one and unlike TG D4, it is formed by combining the trigger detection RAM output at the gate.
$\overline{\text{TRACE}}$	Goes low when TRACE is set in the MENU TRIGGER section in the TRACE MODE 16 + 8 + 8 or 16 + 16(2).
V	
V SYNC.	Signal sent to the CRT display PC board. Vertical sync signal.
V SYNC V	Vertical sync signal sent to video printer.



BLOCK DIAGAM

2. ADJUSTMENT PROCEDURES

1. POWER (A12)

Preparation

. Connect the power cord of this equippment to commercial power via an autotransformer.

. Connect a digital multimeter to the +5 V line.

. Connect an oscilloscope to the +5 V line.

☐ +5 V ADJ

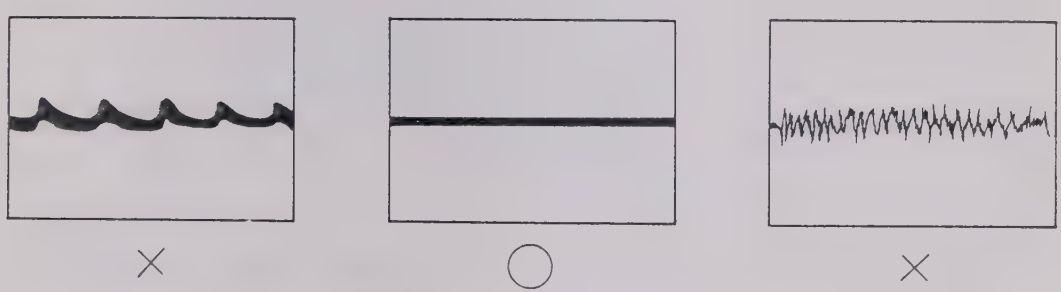
(1) Set the autotransformer output voltage at 100 V (or 200 V).

(2) Adjust R52 for +5 V line voltage of +4.95 V to 5.05 V.

☐ RIPPLE ADJ

(1) Change the autotransformer output voltage from 85 V through 130 V (or 170 V through 250 V).

(2) Adjust R42 for a +5 V line ripple of 100 mVp-p or less.



×　　○　　×

2. CRT DISPLAY (A10)

☐ HV

(1) For measurement, use a high tension probe in combination with the digital multimeter.

(2) Adjust R99 for a V1 anode voltage of 7 KV ± 3 %.

☐ FOCUS

(1) Display MENU on the screen.

(2) Adjust R131 for clearest visually.

☐ INTEN

(1) Display cross pattern.

. Turn ON the S2 TEST switch of CPU (A2).

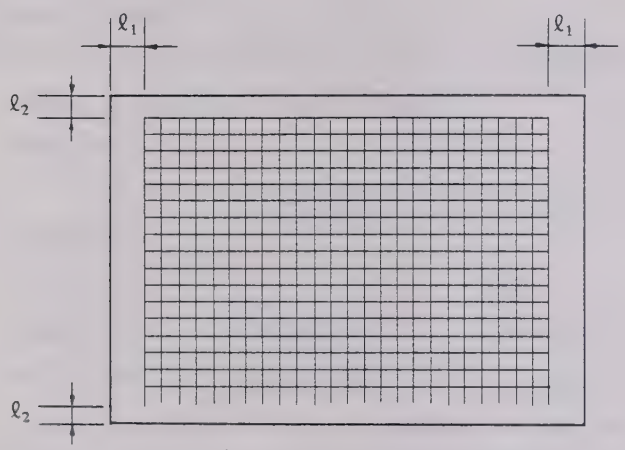
. Press the [5] key on the keyboard (A11) and cross pattern will be displayed.

(2) Adjust R91 for a V1 CRT screen center intensity of 25nt on Luminance Meter 1°.

☐ V GAIN, H GAIN

(1) Display cross pattern.

(2) Adjust R9, R46, CRT deflection yoke and centering magnet for the pattern size as shown below.



ℓ_1 = 10mm +1, −0mm

ℓ_2 = 5mm +1, −0mm

☐ V LIN

(1) Display cross pattern.

(2) Adjust R20 for highest vertical linearity visually.

☐ HL1, HL2, HL3

(1) Display cross pattern.

(2) Adjust R62, R64 and R57 for highest horizontal linearity visually.

3. CLOCK DISTRIBUTOR (A6)

☐ OFFSET

(1) Mount each probe to respective probe port on the rear panel.

(2) Display the MENU and set the following conditions. Then, press the RUN key.

. TRACE MODE 16ch + 8ch + 8ch

. THRESHOLD DAC

A + 0.00 V B + 0.00 V C + 0.00 V

. THRESHOLD

DAC A	DAC B	DAC C
(PROBE D.C)	(PROBE B)	(PROBE A)

(3) Measure the PROBE (A14) threshold line voltage (J2-3 or J2-21) with a digital multimeter.

(4) For each probe adjust R1, R2 and R3 for threshold line voltage of -0.01 V to +0.01 V.

. PROBE B R1

. PROBE A R2

. PROBE D R3

☐ DYNAMIC RANGE

(1) Set the following conditions in the MENU and press the RUN key.

. TRACE MODE 16ch + 8ch + 8ch

. THRESHOLD DAC

A + 6.35 V B + 0.00 V C + 0.00 V

. THRESHOLD

		DAC A
(PROBE D.C)	(PROBE B)	(PROBE A)

(2) Adjust R4 for a threshold line voltage of probe B of +2.222 V (upper limit), +2.116 V (center value) and +2.011 V (lower limit).

(3) Return to the steps of PROBE OFFSET and readjust.

4. PROBE (A14)

Preparation

(1) Insert the probe A to the equipment INPUT A and keep other probes removed.

(2) Set the following conditions in the MENU and press the RUN key.

. TRACE MODE 16ch + 8ch + 8ch

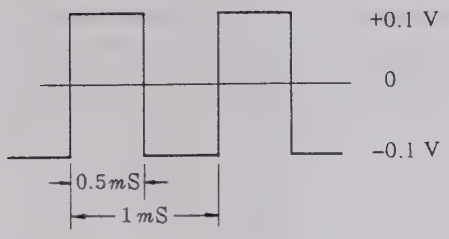
. THRESHOLD DAC

A + 0.00 V

. THRESHOLD

DAC A	DAC A	DAC A
(PROBE D.C)	(PROBE B)	(PROBE A)

(3) Output the following waveform from the pulse generator.



☐ CH0

(1) Input the pulse generator output signal to J1-2.

(2) Connect J1-3 to J1-9 to +5 V.

(3) Connect an oscilloscope to U1-9.

(4) Adjust R6 for a waveform observed on the oscilloscope same as the input waveform.

☐ CH1 THROUGH CH7

Set the conditions as shown below for each channel and adjust in the same manner as for CH0.

	CH 1	CH 2	CH 3	CH 4	CH 5	CH 6	CH 7
(1)	J1-3	J1-4	J1-5	J1-6	J1-7	J1-8	J1-9
(2)	Connect to +5 V with the exception of the measurement input chip.						
(3)	U1-4	U21-9	U21-4	U41-9	U41-4	U61-9	U61-4
(4)	R16	R26	R36	R46	R56	R66	R76

5. PERFORMANCE CHECK

☐ THRESHOLD VOLTAGE

(1) Insert each probe to respective probe port on the rear panel.

(2) Display the MENU and set the following conditions. Then, press the RUN key.

. TRACE MODE 16ch + 8ch + 8ch

. THRESHOLD DAC

A Input the DAC set value shown in the table in the next page.

. THRESHOLD

DAC A (PROBE D.C)	DAC A (PROBE B)	DAC A (PROBE A)

(3) Connect a digital multimeter to the PROBE (A14) threshold line (J2-3 or J2-21).

(4) For each probe, check that the digital multimeter reading is within the limit shown below for each DAC setting.

DAC setting	Threshold voltage range
-6.30 V	-2.011 V to -2.222 V
-6.30 V	-1.995 V to -2.205 V
-6.20 V	-1.963 V to -2.170 V
-6.00 V	-1.900 V to -2.100 V
-5.60 V	-1.773 V to -1.960 V
-4.80 V	-1.520 V to -1.680 V
-3.20 V	-1.013 V to -1.120 V

☐ CLOCK FREQUENCY

(1) Display the MENU and set the following conditions. Then, press the RUN key.

. TRACE MODE 16ch + 8ch + 8ch

. TRIGGER NOT USED A11 X

(PROBE D, C, B SECTION) (PROBE A SECTION)

. DELAY [A] 0 CLOCKS

. CLOCK INT 50nSEC

(PROBE A)

(2) Connect a frequency counter to the TRIGGER DETECTOR (A7) TP1.

(3) Check that the frequency counter reading is within the limit shown in the table below for each set cycle.

Set cycle	Reading
50nS	19.98 MHz to 20.02 MHz
100"	9.990 to 10.01
200"	4.995 to 5.005
500"	1.998 to 2.002
1µS	0.999 to 1.001
2"	499.5 KHz to 500.5 KHz
5"	199.8 to 200.2
10"	99.9 to 100.1
20"	49.95 to 50.05
50"	19.98 to 20.02
100"	9.990 to 10.01
200"	4.995 to 5.005
500"	1.998 to 2.002
1mS	0.999 to 1.001
2"	499.5 Hz to 500.5 Hz
5"	199.8 to 200.2
10"	99.90 to 100.1
20"	49.95 to 50.05
50"	19.98 to 20.02

☐ SELF DIAGNOSIS

(1) Turn ON the POWER switch of the unit.

(2) Press the CPU (A2) S2 and the following message will appear at the top of the CRT screen.

*** VP-3620 SELF DIAGNOSIS *** VER 01.00

(3) Press respective number key shown below to make the following function check.

KEY No.

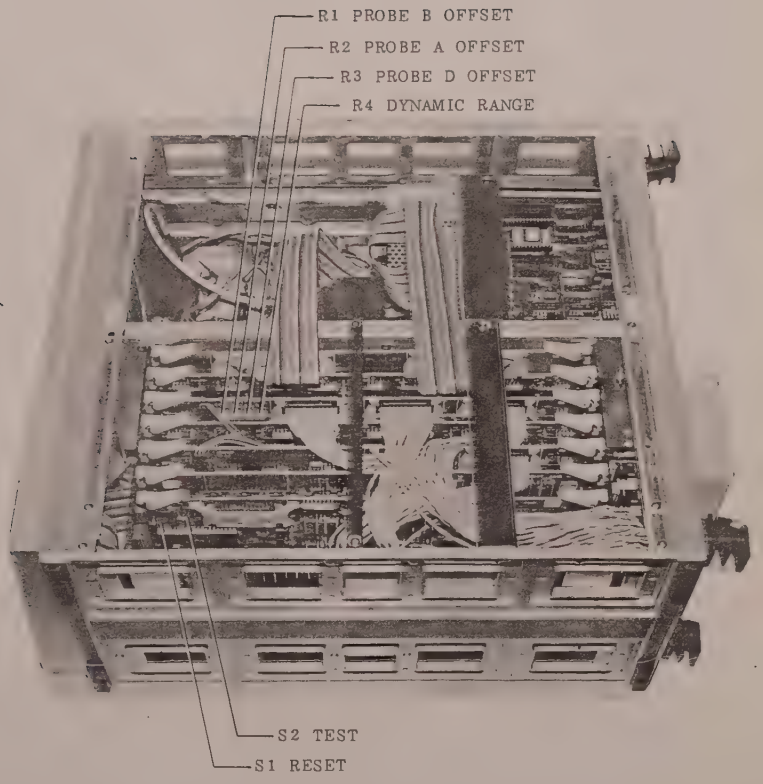
[0] ROM check

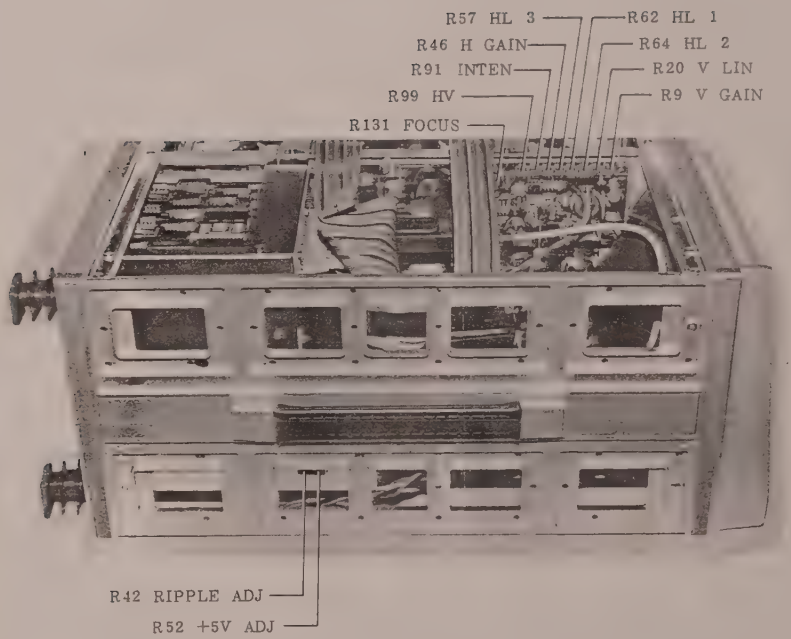
[1] RAM check

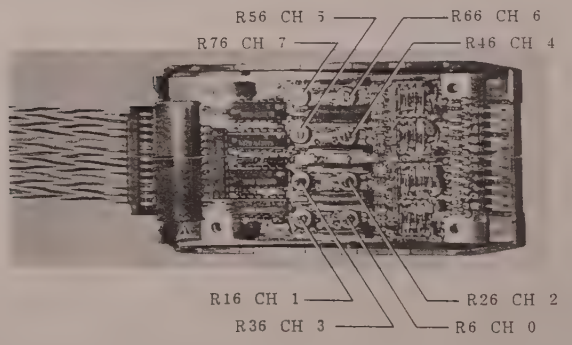
[4] OPTION RAM check (an error is caused if without option.)

[6] VIDEO RAM check

[2] PROBE check (connect all probe input chips to GND.)







ADJUSTMENT LOCATION

3. PARTS LIST

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MAIN FRAME DWG NO 4G204319

REF	NO	PART NO	DESCRIPTION		MFR/DBR	CODE-NO
B	1	PXJ43B1	FAN		16375	261020180
DS	1	SY403DA	LED	UMBER	12167	776000580
E	1	170148-1	CONNECTOR	MATE-N-LOK CONTACT SOC	14441	911100870
E	2	170148-1	CONNECTOR	MATE-N-LOK CONTACT SOC	14441	911100870
E	3	170148-1	CONNECTOR	MATE-N-LOK CONTACT SOC	14441	911100870
E	4	170148-1	CONNECTOR	MATE-N-LOK CONTACT SOC	14441	911100870
E	5	170148-1	CONNECTOR	MATE-N-LOK CONTACT SOC	14441	911100870
E	6	170148-1	CONNECTOR	MATE-N-LOK CONTACT SOC	14441	911100870
E	11	50-6010	PC GUIDE	L=112.8MM	17194	911101800
E	12	50-6010	PC GUIDE	L=112.8MM	17194	911101800
E	13	50-6010	PC GUIDE	L=112.8MM	17194	911101800
E	14	50-6010	PC GUIDE	L=112.8MM	17194	911101800
E	15	50-6010	PC GUIDE	L=112.8MM	17194	911101800
E	16	50-6010	PC GUIDE	L=112.8MM	17194	911101800
E	17	50-6010	PC GUIDE	L=112.8MM	17194	911101800
E	18	50-6010	PC GUIDE	L=112.8MM	17194	911101800
E	19	50-6010	PC GUIDE	L=112.8MM	17194	911101800
E	20	50-6010	PC GUIDE	L=112.8MM	17194	911101800
E	21	50-6010	PC GUIDE	L=112.8MM	17194	911101800
E	22	50-6010	PC GUIDE	L=112.8MM	17194	911101800
E	23	50-6010	PC GUIDE	L=112.8MM	17194	911101800
E	24	50-6010	PC GUIDE	L=112.8MM	17194	911101800
E	25	50-6010	PC GUIDE	L=112.8MM	17194	911101800
E	26	50-6010	PC GUIDE	L=112.8MM	17194	911101800
E	31	76J003	CONNECTOR	POWER	11191	919100040
E	41	47745	CONNECTOR	PV.TERMINAL	15176	911002450
E	42	47745	CONNECTOR	PV.TERMINAL	15176	911002450
E	43	47745	CONNECTOR	PV.TERMINAL	15176	911002450
E	51	965	MAGNET		10001	854302250
E	52	965	MAGNET		10001	854302250
E	53	965	MAGNET		10001	854302250
E	54	965	MAGNET		10001	854302250
E	55	965	MAGNET		10001	854302250
E	56	965	MAGNET		10001	854302250
E	57	965	MAGNET		10001	854302250
E	58	965	MAGNET		10001	854302250
F	1	TSC5A	FUSE	5A 250V 20MM	12219	891000170
F	2	TSC5A	FUSE	5A 250V 20MM	12219	891000170
J	1	UG625UNI	CONNECTOR:COAX	BNC PANEL JACK	12402	912400200
J	2	UG625UNI	CONNECTOR:COAX	BNC PANEL JACK	12402	912400200
J	3	UG625UNI	CONNECTOR:COAX	BNC PANEL JACK	12402	912400200
J	4	TCS818-0101	CONNECTOR	8P DIN	15973	910100370
L	1	YS32931	P3620A COIL	CRT	10001	854302240
MM	**	MMP3620A-0	INSTRUCTION MANUAL	4G183064	10001	271075910

MAIN FRAME DWG NO 4G20431°

REF	NO	PART NO	DESCRIPTION		MFR/DBR	CODE-NO
P	1	M3305S13	CONNECTOR:PIN	5P L:300	16368	911001980
P	2	M3110S13	CONNECTOR:PIN	10P L:300	16368	911002140
P	3	65039-034	CONNECTOR	LATCH HOUSING 3P	15176	911003020
P	4	1-480318-0	CONNECTOR	MATE-N-LOK 2P PLUG	14441	911100730
P	5	1-480424-0	CONNECTOR	MATE-N-LOK 4P PLUG	14441	911102030
S	1	ESB701T	PUSHB SW	DPDT 3A-250V AC	29810	873000840
V	1	C8M46P31	CRT	8INCH FLAT FACE P-31	12167	751100160
W	1	33-76E-2M	CABLE:PWR (UL,CSA)	125V 7A	15360	918100261
W	2	3G470105	P3620A CABLE ASSY	DATA CABLE 26P TWIST	ORGNL	918201090
W	3	3G470105	P3620A CABLE ASSY	DATA CABLE 26P TWIST	ORGNL	918201090
W	4	3G470105	P3620A CABLE ASSY	DATA CABLE 26P TWIST	ORGNL	918201090
W	5	3G470105	P3620A CABLE ASSY	DATA CABLE 26P TWIST	ORGNL	918201090
W	6	3G470105	P3620A CABLE ASSY	DATA CABLE 26P TWIST	ORGNL	918201090
XV	1	TV801	CRT SOCKET		13351	901400100

CPU DWG NO 4G204320

REF	NO	PART NO	DESCRIPTION		MFR/DBR	CODE-NO
C	1	ECKW1H102KB5	C:FXD CER HI-K	1000PF +-10% 50V	29897	822000109
C	2	ECKW1H103ZF5	C:FXD CER HI-K	10000PF +80-20% 50V	29897	822000133
C	3	ECEA1HS2R2	C:FXD AL ELECT	2.2UF +30%-10% 50V	29880	820018820
C	4	ECKW1H103ZF5	C:FXD CER HI-K	10000PF +80-20% 50V	29897	822000133
C	21	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	22	ECEA1CS100	C:FXD AL ELECT	10UF +30%-10% 16V	29880	820018310
C	23	ECEA1CS100	C:FXD AL ELECT	10UF +30%-10% 16V	29880	820018310
C	24	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	25	ECEA1CS100	C:FXD AL ELECT	10UF +30%-10% 16V	29880	820018310
C	26	ECEA1HS2R2	C:FXD AL ELECT	2.2UF +30%-10% 50V	29880	820018820
C	27	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	28	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	61	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	62	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	63	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	64	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	81	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	101	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	102	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	103	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	104	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	105	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	106	ECEB1CS101	C:FXD AL ELECT	100UF +30%-10% 16V	29880	820088350
C	107	ECEB1CS101	C:FXD AL ELECT	100UF +30%-10% 16V	29880	820088350
CR	1	MA150TA	DIODE:SI	100MA 35V	29256	773150010
CR	21	MA150TA	DIODE:SI	100MA 35V	29256	773150010
CR	22	MA150TA	DIODE:SI	100MA 35V	29256	773150010
E	1	1G401206-1	P3620A PC BOARD	CPU BOARD	ORGNL	971120610
E	2	R76J-CRP-04	CARD PULLER CRP-04		17194	270031490
E	3	R76J-CRP-04	CARD PULLER CRP-04		17194	270031490
FL	1	DSS31055D223	NOISE FILTER	7A 50V 22UF	16551	856400210
FL	2	DSS31055D223	NOISE FILTER	7A 50V 22UF	16551	856400210
J	1	3429-1002LCS	CONNECTOR	PIN HEADER 20P	12017	911102510
Q	1	2SC828A-RS	TSTR:SI NPN	PC:250MW FT:220MHZ	29256	762828120
R	1	ERD25TJ103V	R:FXD CARBON	10K OHM 5% 1/4W	29866	807323100
R	2	ERD25TJ332V	R:FXD CARBON	3.3K OHM 5% 1/4W	29866	807322330
R	3	ERD25TJ823V	R:FXD CARBON	82K OHM 5% 1/4W	29866	807323820
R	21	ERD25TJ563V	R:FXD CARBON	56K OHM 5% 1/4W	29866	807323560
R	22	ERD25TJ472V	R:FXD CARBON	4.7K OHM 5% 1/4W	29866	807322470
R	23	EXBP88562K	R:NETWORK	5.6K OHM X8 10% 1/8W	29861	809990570
R	24	ERD25TJ104V	R:FXD CARBON	100K OHM 5% 1/4W	29866	807324100
R	25	ERD25TJ102V	R:FXD CARBON	1K OHM 5% 1/4W	29866	807322100
R	26	ERD25TJ473V	R:FXD CARBON	47K OHM 5% 1/4W	29866	807323470
R	27	ERD25TJ472V	R:FXD CARBON	4.7K OHM 5% 1/4W	29866	807322470
R	28	ERD25TJ153V	R:FXD CARBON	15K OHM 5% 1/4W	29866	807323150
R	61	ERD25TJ471V	R:FXD CARBON	470 OHM 5% 1/4W	29866	807321470
R	62	ERD25TJ221V	R:FXD CARBON	220 OHM 5% 1/4W	29866	807321220
R	101	EXBP88562K	R:NETWORK	5.6K OHM X8 10% 1/8W	29861	809990570
R	102	EXBP88562K	R:NETWORK	5.6K OHM X8 10% 1/8W	29861	809990570
R	103	EXBP88562K	R:NETWORK	5.6K OHM X8 10% 1/8W	29861	809990570
R	104	EXBP88562K	R:NETWORK	5.6K OHM X8 10% 1/8W	29861	809990570
R	105	EXBP84562J	R:NETWORK	5.6K OHM X4 5% 1/8W	29861	809990370

CPU DWG NO 4G204320

REF	NO	PART NO	DESCRIPTION		MFR/DBR	CODE-NO
S	1	KEG10901	KEY BOARD SW	DC12V 20MA	11154	873003990
S	2	KEG10901	KEY BOARD SW	DC12V 20MA	11154	873003990
U	6	SN74LS42AN	IC:TTL LS	BCD-DECIMAL DECODER	14558	640744220
U	8	M51841P	IC:LINEAR	TIMER	17960	659990020
U	21	UPD8279C5	IC:N MOS	KBD/DISPLAY CONTROLLER	12167	602060110
U	24	SN74LS04N	IC:TTL LS	HEX INVERTER	14558	640740420
U	26	SN74LS00N	IC:TTL LS	QUAD 2-INPUT NAND GATE	14558	640740020
U	27	SN74LS10N	IC:TTL LS	TRIPLE 3-INPUT NAND GATE	14558	640741020
U	28	SN74LS20N	IC:TTL LS	DUAL 4-INPUT NAND GATE	14558	640742020
U	29	SN74LS123N	IC:TTL LS	DUAL MONO MULTIVIBRATOR	14558	647412320
U	30	SN74LS138N	IC:TTL LS	3-TO-8 LINE DECODER	14558	647413820
U	31	SN74LS138N	IC:TTL LS	3-TO-8 LINE DECODER	14558	647413820
U	32	UPD4016C1	IC:N MOS	2K X8 STATIC RAM 250NS	12167	610401610
U	33	UPD4016C1	IC:N MOS	2K X8 STATIC RAM 250NS	12167	610401610
U	34	TMS2532JL	IC:N MOS	4K X8 EPROM	14558	602040020
U	52	UPD4016C1	IC:N MOS	2K X8 STATIC RAM 250NS	12167	610401610
U	53	UPD4016C1	IC:N MOS	2K X8 STATIC RAM 250NS	12167	610401610
U	54	TMS2532JL	IC:N MOS	4K X8 EPROM	14558	602040020
U	61	P8085A	IC:N MOS	8-BIT MICROPROCESSOR	17960	602140000
U	64	UPB8212C	IC:TTL	8-BIT I/O PORT	12167	610821240
U	66	SN74LS125N	IC:TTL LS	QUAD 3-STATE BUFFER	14558	647412520
U	67	SN74LS04N	IC:TTL LS	HEX INVERTER	14558	640740420
U	68	SN74LS08N	IC:TTL LS	QUAD 2-INPUT AND GATE	14558	640740820
U	69	SN74LS138N	IC:TTL LS	3-TO-8 LINE DECODER	14558	647413820
U	70	SN74LS138N	IC:TTL LS	3-TO-8 LINE DECODER	14558	647413820
U	71	SN74LS138N	IC:TTL LS	3-TO-8 LINE DECODER	14558	647413820
U	72	UPD4016C1	IC:N MOS	2K X8 STATIC RAM 250NS	12167	610401610
U	73	TMS2532JL	IC:N MOS	4K X8 EPROM	14558	602040020
U	74	TMS2532JL	IC:N MOS	4K X8 EPROM	14558	602040020
U	92	UPD4016C1	IC:N MOS	2K X8 STATIC RAM 250NS	12167	610401610
U	93	TMS2532JL	IC:N MOS	4K X8 EPROM	14558	602040020
U	94	TMS2532JL	IC:N MOS	4K X8 EPROM	14558	602040020
U	101	M5L8224P	IC:N MOS	CLOCK GENERATOR	17960	602110360
U	102	SN74LS244N	IC:TTL LS	OCTAL BUFFER 3-STATE	14558	647424420
U	103	SN74LS244N	IC:TTL LS	OCTAL BUFFER 3-STATE	14558	647424420
U	104	SN74LS244N	IC:TTL LS	OCTAL BUFFER 3-STATE	14558	647424420
U	105	SN74LS125N	IC:TTL LS	QUAD 3-STATE BUFFER	14558	647412520
U	106	SN74LS138N	IC:TTL LS	3-TO-8 LINE DECODER	14558	647413820
U	107	SN74LS138N	IC:TTL LS	3-TO-8 LINE DECODER	14558	647413820
U	108	SN74LS138N	IC:TTL LS	3-TO-8 LINE DECODER	14558	647413820
U	109	SN74LS138N	IC:TTL LS	3-TO-8 LINE DECODER	14558	647413820
U	110	SN74LS138N	IC:TTL LS	3-TO-8 LINE DECODER	14558	647413820
U	111	SN74LS138N	IC:TTL LS	3-TO-8 LINE DECODER	14558	647413820
U	112	SN74LS244N	IC:TTL LS	OCTAL BUFFER 3-STATE	14558	647424420
U	113	TMS2532JL	IC:N MOS	4K X8 EPROM	14558	602040020

CPU DWG NO 4G204320

REF NO	PART NO	DESCRIPTION		MFR/DBR	CODE-NO
XU 21	JC4640-11	IC SOCKET	40-PIN DIL	14558	903400560
XU 32	JC4624-11	IC SOCKET	24-PIN DIL	14558	903400540
XU 33	JC4624-11	IC SOCKET	24-PIN DIL	14558	903400540
XU 34	JC4624-11	IC SOCKET	24-PIN DIL	14558	903400540
XU 52	JC4624-11	IC SOCKET	24-PIN DIL	14558	903400540
XU 53	JC4624-11	IC SOCKET	24-PIN DIL	14558	903400540
XU 54	JC4624-11	IC SOCKET	24-PIN DIL	14558	903400540
XU 61	JC4640-11	IC SOCKET	40-PIN DIL	14558	903400560
XU 64	JC4624-11	IC SOCKET	24-PIN DIL	14558	903400540
XU 72	JC4624-11	IC SOCKET	24-PIN DIL	14558	903400540
XU 73	JC4624-11	IC SOCKET	24-PIN DIL	14558	903400540
XU 74	JC4624-11	IC SOCKET	24-PIN DIL	14558	903400540
XU 92	JC4624-11	IC SOCKET	24-PIN DIL	14558	903400540
XU 93	JC4624-11	IC SOCKET	24-PIN DIL	14558	903400540
XU 94	JC4624-11	IC SOCKET	24-PIN DIL	14558	903400540
XU 113	JC4624-11	IC SOCKET	24-PIN DIL	14558	903400540
Y 1	KMP061	CRYSTAL:QUARTZ OSC	6.14MHZ	11357	893004690

DISPLAY RAM DWG NO 4G204321

REF	NO	PART NO	DESCRIPTION		MFR/DBR	CODE-NO
C	1	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	2	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	21	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	22	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	23	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	24	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	25	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	26	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	27	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	28	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	29	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	30	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	31	ECCW1H331K5	C:FXD CER TC	330PF +-10% 50V SL	29897	822000627
C	32	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	33	ECCW1H150KC5	C:FXD CER TC	15PF +-10% 50V NPO	29897	822000651
C	33	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	41	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	42	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	43	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	44	ECKW1H102KB5	C:FXD CER HI-K	1000PF +-10% 50V	29897	822000109
C	45	ECQM1H152KZ	C:FXD FLM	1500PF 10% 50V	26550	825121540
C	46	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	47	ECQM1H472KZ	C:FXD FLM	4700PF 10% 50V	26550	825124740
C	61	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	62	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	63	ECCW1H331K5	C:FXD CER TC	330PF +-10% 50V SL	29897	822000627
C	64	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	65	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	66	ECEB1VS220	C:FXD AL ELECT	22UF +30%-10% 35V	29880	820088700
C	67	ECEB1VS220	C:FXD AL ELECT	22UF +30%-10% 35V	29880	820088700
C	68	ECEB1CS101	C:FXD AL ELECT	100UF +30%-10% 16V	29880	820088350
C	69	ECCW1H221K5	C:FXD CER TC	220PF +-10% 50V SL	29897	822000625
C	70	ECCW1H471K5	C:FXD CER TC	470PF +-10% 50V SL	29897	822000629
C	71	ECCW1H221K5	C:FXD CER TC	220PF +-10% 50V SL	29897	822000625
E	1	1G401207-1	P3620A PC BOARD	DISPLAY RAM BOARD	ORGNL	971120710
E	2	R76J-CRP-04	CARD PULLER CRP-04		17194	270031490
E	3	R76J-CRP-04	CARD PULLER CRP-04		17194	270031490
FL	61	DSS31055D223	NOISE FILTER	7A 50V 22UF	16551	856400210
FL	62	DSS31055D223	NOISE FILTER	7A 50V 22UF	16551	856400210
R	47	ERD25TJ153V	R:FXD CARBON	15K OHM 5% 1/4W	29866	807323150
R	61	ERD25TJ223V	R:FXD CARBON	22K OHM 5% 1/4W	29866	807323220
R	62	ERD25TJ101V	R:FXD CARBON	100 OHM 5% 1/4W	29866	807321100
R	63	ERD25TJ101V	R:FXD CARBON	100 OHM 5% 1/4W	29866	807321100
U	15	SN74LS393N	IC:TTL LS	DUAL BINARY COUNTER	14558	647439320
U	16	SN74LS30N	IC:TTL LS	8-INPUT NAND GATE	14558	640743020
U	17	SN74LS393N	IC:TTL LS	DUAL BINARY COUNTER	14558	647439320
U	18	SN74LS00N	IC:TTL LS	QUAD 2-INPUT NAND GATE	14558	640740020
U	21	UPD4016C1	IC:N MOS	2K X8 STATIC RAM 250NS	12167	610401610
U	22	UPD4016C1	IC:N MOS	2K X8 STATIC RAM 250NS	12167	610401610
U	23	UPD4016C1	IC:N MOS	2K X8 STATIC RAM 250NS	12167	610401610
U	24	UPD4016C1	IC:N MOS	2K X8 STATIC RAM 250NS	12167	610401610
U	25	UPD4016C1	IC:N MOS	2K X8 STATIC RAM 250NS	12167	610401610
U	26	UPD4016C1	IC:N MOS	2K X8 STATIC RAM 250NS	12167	610401610
U	27	UPD4016C1	IC:N MOS	2K X8 STATIC RAM 250NS	12167	610401610
U	28	UPD4016C1	IC:N MOS	2K X8 STATIC RAM 250NS	12167	610401610
U	33	SN74LS86N	IC:TTL LS	QUAD EXCLUSIVE OR GATE	14558	640748620
U	34	SN74LS74AN	IC:TTL LS	DUAL D-TYPE FLIP-FLOP	14558	640747420
U	35	SN74LS393N	IC:TTL LS	DUAL BINARY COUNTER	14558	647439320
U	36	SN74LS00N	IC:TTL LS	QUAD 2-INPUT NAND GATE	14558	640740020
U	37	SN74LS04N	IC:TTL LS	HEX INVERTER	14558	640740420

DISPLAY RAM DWG NO 4G204321

REF NO	PART NO	DESCRIPTION		MFR/DBR	CODE-NO
U 38	SN74LS74AN	IC:TTL LS	DUAL D-TYPE FLIP-FLOP	14558	640747420
U 39	M5L8224P	IC:N MOS	CLOCK GENERATOR	17960	602110360
U 41	SN74LS157N	IC:TTL LS	QUAD 2-TO-1 LINE SELECT	14558	647415720
U 42	SN74LS42AN	IC:TTL LS	BCD-DECIMAL DECODER	14558	640744220
U 43	SN74LS157N	IC:TTL LS	QUAD 2-TO-1 LINE SELECT	14558	647415720
U 44	SN74LS157N	IC:TTL LS	QUAD 2-TO-1 LINE SELECT	14558	647415720
U 45	SN74LS393N	IC:TTL LS	DUAL BINARY COUNTER	14558	647439320
U 46	SN74LS393N	IC:TTL LS	DUAL BINARY COUNTER	14558	647439320
U 47	SN74LS165N	IC:TTL LS	8BIT SHIFT REGISTER PISO	14558	647416520
U 48	SN74LS165N	IC:TTL LS	8BIT SHIFT REGISTER PISO	14558	647416520
U 49	SN74LS165N	IC:TTL LS	8BIT SHIFT REGISTER PISO	14558	647416520
U 50	SN74LS165N	IC:TTL LS	8BIT SHIFT REGISTER PISO	14558	647416520
U 52	SN74LS74AN	IC:TTL LS	DUAL D-TYPE FLIP-FLOP	14558	640747420
U 53	SN74LS00N	IC:TTL LS	QUAD 2-INPUT NAND GATE	14558	640740020
U 54	SN74LS00N	IC:TTL LS	QUAD 2-INPUT NAND GATE	14558	640740020
U 55	SN74LS04N	IC:TTL LS	HEX INVERTER	14558	640740420
U 56	SN74LS42AN	IC:TTL LS	BCD-DECIMAL DECODER	14558	640744220
U 57	SN74LS139N	IC:TTL LS	DUAL 2-TO-4 LINE DECODER	14558	647413920
U 58	SN74LS123N	IC:TTL LS	DUAL MONO MULTIVIBRATOR	14558	647412320
U 61	SN74LS138N	IC:TTL LS	3-TO-8 LINE DECODER	14558	647413820
U 62	SN74LS157N	IC:TTL LS	QUAD 2-TO-1 LINE SELECT	14558	647415720
U 63	SN74LS157N	IC:TTL LS	QUAD 2-TO-1 LINE SELECT	14558	647415720
U 64	SN74LS244N	IC:TTL LS	OCTAL BUFFER 3-STATE	14558	647424420
U 65	SN74LS244N	IC:TTL LS	OCTAL BUFFER 3-STATE	14558	647424420
U 66	SN74LS244N	IC:TTL LS	OCTAL BUFFER 3-STATE	14558	647424420
U 72	SN74LS04N	IC:TTL LS	HEX INVERTER	14558	640740420
U 73	SN74LS10N	IC:TTL LS	TRIPLE 3-INPUT NAND GATE	14558	640741020
U 74	SN74LS08N	IC:TTL LS	QUAD 2-INPUT AND GATE	14558	640740820
U 75	SN74LS10N	IC:TTL LS	TRIPLE 3-INPUT NAND GATE	14558	640741020
U 76	SN74LS00N	IC:TTL LS	QUAD 2-INPUT NAND GATE	14558	640740020
U 77	SN74LS32N	IC:TTL LS	QUAD 2 INPUT OR GATE	14558	640743220
XU 21	JC4624-11	IC SOCKET	24-PIN DIL	14558	903400540
XU 22	JC4624-11	IC SOCKET	24-PIN DIL	14558	903400540
XU 23	JC4624-11	IC SOCKET	24-PIN DIL	14558	903400540
XU 24	JC4624-11	IC SOCKET	24-PIN DIL	14558	903400540
XU 25	JC4624-11	IC SOCKET	24-PIN DIL	14558	903400540
XU 26	JC4624-11	IC SOCKET	24-PIN DIL	14558	903400540
XU 27	JC4624-11	IC SOCKET	24-PIN DIL	14558	903400540
XU 28	JC4624-11	IC SOCKET	24-PIN DIL	14558	903400540
Y 1	4G461774	CRYSTAL:QUARTZ OSC	8.8MHZ	ORGNL	893417740

INPUT DWG NO 4G204322

REF	NO	PART NO	DESCRIPTION		MFR/DBR	CODE-NO
C	1	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	2	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	3	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	4	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	5	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	6	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	7	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	16	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	18	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	21	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	22	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	61	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	62	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	63	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	64	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	65	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	66	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	67	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	68	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	69	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	70	ECEB1CS101	C:FXD AL ELECT	100UF +30%-10% 16V	29880	820088350
C	71	ECEB1CS101	C:FXD AL ELECT	100UF +30%-10% 16V	29880	820088350
E	1	1G401208-1	P3620A PC BOARD	INPUT BOARD	ORGNL	971120810
E	2	R76J-CRP-04	CARD PULLER CRP-04		17194	270031490
E	3	R76J-CRP-04	CARD PULLER CRP-04		17194	270031490
E	4	60618-1	CONNECTOR	MATE-N-LOK CONTACT PIN	14441	911100880
E	5	60618-1	CONNECTOR	MATE-N-LOK CONTACT PIN	14441	911100880
E	6	60618-1	CONNECTOR	MATE-N-LOK CONTACT PIN	14441	911100880
J	1	3429-1002LCS	CONNECTOR	PIN HEADER 20P	12017	911102510
J	2	3429-1002LCS	CONNECTOR	PIN HEADER 20P	12017	911102510
J	3	163683-1	CONNECTOR:PIN	CIS 3P 2.5PITCH	14441	911001580
P	1	163690-1	CONNECTOR:PIN	CIS 3P 2.5PITCH	14441	911100820
R	1	EXBP88102K	R:NETWORK	1K OHM X8 10% 1/8W	29861	809990420
R	2	EXBP88102K	R:NETWORK	1K OHM X8 10% 1/8W	29861	809990420
U	9	SN74S04N	IC:TTL S	HEX INVERTER	14558	640740410
U	11	SN74S04N	IC:TTL S	HEX INVERTER	14558	640740410
U	12	SN74S04N	IC:TTL S	HEX INVERTER	14558	640740410
U	13	SN74S00N	IC:TTL S	QUAD 2-INPUT NAND GATE	14558	640740010
U	14	SN74S00N	IC:TTL S	QUAD 2-INPUT NAND GATE	14558	640740010
U	15	SN74S04N	IC:TTL S	HEX INVERTER	14558	640740410
U	16	SN74S04N	IC:TTL S	HEX INVERTER	14558	640740410
U	17	SN74S04N	IC:TTL S	HEX INVERTER	14558	640740410
U	18	SN74S00N	IC:TTL S	QUAD 2-INPUT NAND GATE	14558	640740010
U	19	SN74S00N	IC:TTL S	QUAD 2-INPUT NAND GATE	14558	640740010
U	21	SN74S04N	IC:TTL S	HEX INVERTER	14558	640740410

INPUT DWG NO 46204322

REF	NO	PART NO	DESCRIPTION		MFR/DBR	CODE-NO
U	22	SN74S04N	IC:TTL S	HEX INVERTER	14558	640740410
U	23	SN74S00N	IC:TTL S	QUAD 2-INPUT NAND GATE	14558	640740010
U	24	SN74S00N	IC:TTL S	QUAD 2-INPUT NAND GATE	14558	640740010
U	25	SN74S04N	IC:TTL S	HEX INVERTER	14558	640740410
U	26	SN74S04N	IC:TTL S	HEX INVERTER	14558	640740410
U	27	SN74S04N	IC:TTL S	HEX INVERTER	14558	640740410
U	28	SN74S00N	IC:TTL S	QUAD 2-INPUT NAND GATE	14558	640740010
U	29	SN74S00N	IC:TTL S	QUAD 2-INPUT NAND GATE	14558	640740010
U	31	SN74S00N	IC:TTL S	QUAD 2-INPUT NAND GATE	14558	640740010
U	32	SN74S00N	IC:TTL S	QUAD 2-INPUT NAND GATE	14558	640740010
U	33	SN74LS157N	IC:TTL LS	QUAD 2-TO-1 LINE SELECT	14558	647415720
U	34	SN74LS157N	IC:TTL LS	QUAD 2-TO-1 LINE SELECT	14558	647415720
U	35	SN74S74N	IC:TTL S	DUAL D-TYPE FLIP-FLOP	14558	640747410
U	36	SN74S00N	IC:TTL S	QUAD 2-INPUT NAND GATE	14558	640740010
U	37	SN74S00N	IC:TTL S	QUAD 2-INPUT NAND GATE	14558	640740010
U	38	SN74LS157N	IC:TTL LS	QUAD 2-TO-1 LINE SELECT	14558	647415720
U	39	SN74LS157N	IC:TTL LS	QUAD 2-TO-1 LINE SELECT	14558	647415720
U	41	SN74S00N	IC:TTL S	QUAD 2-INPUT NAND GATE	14558	640740010
U	42	SN74S00N	IC:TTL S	QUAD 2-INPUT NAND GATE	14558	640740010
U	43	SN74S175N	IC:TTL S	QUAD D-TYPE FLIP-FLOP	14558	647417510
U	44	SN74S175N	IC:TTL S	QUAD D-TYPE FLIP-FLOP	14558	647417510
U	45	SN74S20N	IC:TTL S	DUAL 4-INPUT NAND GATE	14558	640742010
U	46	SN74S00N	IC:TTL S	QUAD 2-INPUT NAND GATE	14558	640740010
U	47	SN74S00N	IC:TTL S	QUAD 2-INPUT NAND GATE	14558	640740010
U	48	SN74S175N	IC:TTL S	QUAD D-TYPE FLIP-FLOP	14558	647417510
U	49	SN74S175N	IC:TTL S	QUAD D-TYPE FLIP-FLOP	14558	647417510
U	51	SN74S64N	IC:TTL S	4-2-3-2 INPUT AOI	14558	640746410
U	52	SN74S64N	IC:TTL S	4-2-3-2 INPUT AOI	14558	640746410
U	53	SN74S175N	IC:TTL S	QUAD D-TYPE FLIP-FLOP	14558	647417510
U	54	SN74S175N	IC:TTL S	QUAD D-TYPE FLIP-FLOP	14558	647417510
U	55	SN74LS374N	IC:TTL LS	OCTAL D-TYPE FLIP-FLOP	14558	647437420
U	56	SN74S64N	IC:TTL S	4-2-3-2 INPUT AOI	14558	640746410
U	57	SN74S64N	IC:TTL S	4-2-3-2 INPUT AOI	14558	640746410
U	58	SN74S175N	IC:TTL S	QUAD D-TYPE FLIP-FLOP	14558	647417510
U	59	SN74S175N	IC:TTL S	QUAD D-TYPE FLIP-FLOP	14558	647417510
U	61	SN74S08N	IC:TTL S	QUAD 2-INPUT AND GATE	14558	640740810
U	62	SN74LS273N	IC:TTL LS	OCTAL D-TYPE FLIP-FLOP	14558	647427320
U	63	SN74S86N	IC:TTL S	QUAD EXCLUSIVE OR GATE	14558	640748610
U	64	SN74S86N	IC:TTL S	QUAD EXCLUSIVE OR GATE	14558	640748610
U	65	SN74LS374N	IC:TTL LS	OCTAL D-TYPE FLIP-FLOP	14558	647437420
U	66	SN74S08N	IC:TTL S	QUAD 2-INPUT AND GATE	14558	640740810
U	67	SN74LS273N	IC:TTL LS	OCTAL D-TYPE FLIP-FLOP	14558	647427320
U	68	SN74S86N	IC:TTL S	QUAD EXCLUSIVE OR GATE	14558	640748610
U	69	SN74S86N	IC:TTL S	QUAD EXCLUSIVE OR GATE	14558	640748610

MEMORY DWG NO 46204323

REF	NO	PART NO	DESCRIPTION		MFR/DBR	CODE-NO
C	1	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	2	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	3	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	4	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	5	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	6	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	7	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	8	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	9	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	21	ECCW1H820K5	C:FXD CER TC	82PF +-10% 50V SL	29897	822000620
C	61	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	62	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	63	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	64	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	66	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	67	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	68	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	69	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	70	ECEB1CS101	C:FXD AL ELECT	100UF +30%-10% 16V	29880	820088350
E	1	1G401209-1	P3620A PC BOARD	MEMORY BOARD	ORGNL	971120910
E	2	R76J-CRP-04	CARD PULLER CRP-04		17194	270031490
E	3	R76J-CRP-04	CARD PULLER CRP-04		17194	270031490
J	1	65532-102	CONNECTOR:PIN	2P ANGLE TYPE	15176	911002470
J	2	65532-102	CONNECTOR:PIN	2P ANGLE TYPE	15176	911002470
J	3	65532-102	CONNECTOR:PIN	2P ANGLE TYPE	15176	911002470
J	4	65532-102	CONNECTOR:PIN	2P ANGLE TYPE	15176	911002470
J	5	65532-102	CONNECTOR:PIN	2P ANGLE TYPE	15176	911002470
J	6	65532-102	CONNECTOR:PIN	2P ANGLE TYPE	15176	911002470
U	1	SN74LS00N	IC:TTL LS	QUAD 2-INPUT NAND GATE	14558	640740020
U	2	SN74S112N	IC:TTL S	DUAL J-K FLIP-FLOP	14558	647411210
U	3	SN74S112N	IC:TTL S	DUAL J-K FLIP-FLOP	14558	647411210
U	4	SN74S112N	IC:TTL S	DUAL J-K FLIP-FLOP	14558	647411210
U	5	SN74S163N	IC:TTL S	SYNC BINARY COUNTER	14558	647416310
U	6	SN74S163N	IC:TTL S	SYNC BINARY COUNTER	14558	647416310
U	7	SN74S163N	IC:TTL S	SYNC BINARY COUNTER	14558	647416310
U	8	SN74S163N	IC:TTL S	SYNC BINARY COUNTER	14558	647416310
U	9	SN74S163N	IC:TTL S	SYNC BINARY COUNTER	14558	647416310
U	11	SN74S32N	IC:TTL S	QUAD 2-INPUT OR GATE	14558	640743210
U	12	SN74LS08N	IC:TTL LS	QUAD 2-INPUT AND GATE	14558	640740820
U	13	SN74S163N	IC:TTL S	SYNC BINARY COUNTER	14558	647416310
U	14	SN74S163N	IC:TTL S	SYNC BINARY COUNTER	14558	647416310
U	15	SN74S51N	IC:TTL S	DUAL 2-WIDE 2-INPUT AOI	14558	640745110
U	16	SN74S163N	IC:TTL S	SYNC BINARY COUNTER	14558	647416310
U	17	SN74S163N	IC:TTL S	SYNC BINARY COUNTER	14558	647416310
U	18	SN74S163N	IC:TTL S	SYNC BINARY COUNTER	14558	647416310
U	19	SN74S163N	IC:TTL S	SYNC BINARY COUNTER	14558	647416310
U	21	SN74S02N	IC:TTL S	QUAD 2INPUT NOR-GATE	14558	640740210
U	22	SN74S51N	IC:TTL S	DUAL 2-WIDE 2-INPUT AOI	14558	640745110
U	23	SN74S163N	IC:TTL S	SYNC BINARY COUNTER	14558	647416310
U	24	SN74S163N	IC:TTL S	SYNC BINARY COUNTER	14558	647416310
U	25	SN74S51N	IC:TTL S	DUAL 2-WIDE 2-INPUT AOI	14558	640745110
U	26	UPD2149D-2	IC:N MOS	STATIC RAM 1KX4 35NS	12167	602060180

MEMORY DWG NO 4G204323

REF NO	PART NO	DESCRIPTION	MFR/DBR	CODE-NO
U 27	UPD2149D-2	IC:N MOS STATIC RAM 1KX4 35NS	12167	602060180
U 28	UPD2149D-2	IC:N MOS STATIC RAM 1KX4 35NS	12167	602060180
U 29	UPD2149D-2	IC:N MOS STATIC RAM 1KX4 35NS	12167	602060180
U 31	SN74S64N	IC:TTL S 4-2-3-2 INPUT AOI	14558	640746410
U 32	SN74S51N	IC:TTL S DUAL 2-WIDE 2-INPUT AOI	14558	640745110
U 33	SN74S163N	IC:TTL S SYNC BINARY COUNTER	14558	647416310
U 34	SN74S163N	IC:TTL S SYNC BINARY COUNTER	14558	647416310
U 36	UPD2149D-2	IC:N MOS STATIC RAM 1KX4 35NS	12167	602060180
U 37	UPD2149D-2	IC:N MOS STATIC RAM 1KX4 35NS	12167	602060180
U 38	UPD2149D-2	IC:N MOS STATIC RAM 1KX4 35NS	12167	602060180
U 39	UPD2149D-2	IC:N MOS STATIC RAM 1KX4 35NS	12167	602060180
U 41	SN74S64N	IC:TTL S 4-2-3-2 INPUT AOI	14558	640746410
U 42	SN74S04N	IC:TTL S HEX INVERTER	14558	640740410
U 43	SN74S163N	IC:TTL S SYNC BINARY COUNTER	14558	647416310
U 44	SN74S163N	IC:TTL S SYNC BINARY COUNTER	14558	647416310
U 46	SN74LS374N	IC:TTL LS OCTAL D-TYPE FLIP-FLOP	14558	647437420
U 47	SN74LS374N	IC:TTL LS OCTAL D-TYPE FLIP-FLOP	14558	647437420
U 48	SN74LS374N	IC:TTL LS OCTAL D-TYPE FLIP-FLOP	14558	647437420
U 49	SN74LS374N	IC:TTL LS OCTAL D-TYPE FLIP-FLOP	14558	647437420
U 51	SN74LS374N	IC:TTL LS OCTAL D-TYPE FLIP-FLOP	14558	647437420
U 52	SN74LS174N	IC:TTL LS HEX D-TYPE FLIP-FLOP	14558	647417420
U 53	SN74S163N	IC:TTL S SYNC BINARY COUNTER	14558	647416310
U 54	SN74S163N	IC:TTL S SYNC BINARY COUNTER	14558	647416310
U 56	SN74LS244N	IC:TTL LS OCTAL BUFFER 3-STATE	14558	647424420
U 57	SN74LS244N	IC:TTL LS OCTAL BUFFER 3-STATE	14558	647424420
U 58	SN74LS244N	IC:TTL LS OCTAL BUFFER 3-STATE	14558	647424420
U 59	SN74LS244N	IC:TTL LS OCTAL BUFFER 3-STATE	14558	647424420
U 61	SN74S04N	IC:TTL S HEX INVERTER	14558	640740410
U 62	SN74S74N	IC:TTL S DUAL D-TYPE FLIP-FLOP	14558	640747410
U 63	SN74S163N	IC:TTL S SYNC BINARY COUNTER	14558	647416310
U 64	SN74S163N	IC:TTL S SYNC BINARY COUNTER	14558	647416310
U 66	SN74LS374N	IC:TTL LS OCTAL D-TYPE FLIP-FLOP	14558	647437420
U 67	SN74LS374N	IC:TTL LS OCTAL D-TYPE FLIP-FLOP	14558	647437420
U 68	SN74LS374N	IC:TTL LS OCTAL D-TYPE FLIP-FLOP	14558	647437420
U 69	SN74LS374N	IC:TTL LS OCTAL D-TYPE FLIP-FLOP	14558	647437420

CLOCK DISTRIBUTOR DWG NO 4G204324

REF	NO	PART NO	DESCRIPTION		MFR/DBR	CODE-NO
C	1	ECEB1VS220	C:FXD AL ELECT	22UF +30%-10% 35V	29880	820088700
C	2	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	3	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	4	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	5	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	11	ECEB1VS220	C:FXD AL ELECT	22UF +30%-10% 35V	29880	820088700
C	12	ECKW1H223ZF5	C:FXD CER HI-K	22000PF +80-20% 50V	29897	822000134
C	13	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	14	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	15	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	21	ECCW1H101K5	C:FXD CER TC	100PF +-10% 50V SL	29897	822000621
C	22	ECKW1H223ZF5	C:FXD CER HI-K	22000PF +80-20% 50V	29897	822000134
C	23	ECKW1H223ZF5	C:FXD CER HI-K	22000PF +80-20% 50V	29897	822000134
C	24	ECKW1H223ZF5	C:FXD CER HI-K	22000PF +80-20% 50V	29897	822000134
C	31	ECCW1H101K5	C:FXD CER TC	100PF +-10% 50V SL	29897	822000621
C	32	ECKW1H223ZF5	C:FXD CER HI-K	22000PF +80-20% 50V	29897	822000134
C	33	ECKW1H223ZF5	C:FXD CER HI-K	22000PF +80-20% 50V	29897	822000134
C	34	ECKW1H223ZF5	C:FXD CER HI-K	22000PF +80-20% 50V	29897	822000134
C	41	ECCW1H101K5	C:FXD CER TC	100PF +-10% 50V SL	29897	822000621
C	42	ECKW1H223ZF5	C:FXD CER HI-K	22000PF +80-20% 50V	29897	822000134
C	43	ECKW1H223ZF5	C:FXD CER HI-K	22000PF +80-20% 50V	29897	822000134
C	44	ECKW1H223ZF5	C:FXD CER HI-K	22000PF +80-20% 50V	29897	822000134
C	51	ECKW1H222ZF5	C:FXD CER HI-K	2200PF +80-20% 50V	29897	822000131
C	61	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	62	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	63	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	64	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	65	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	66	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	67	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	68	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	69	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C	70	ECEB1CS101	C:FXD AL ELECT	100UF +30%-10% 16V	29880	820088350
C	71	ECEB1CS101	C:FXD AL ELECT	100UF +30%-10% 16V	29880	820088350
CR	1	MA150TA	DIODE:SI	100MA 35V	29256	773150010
DL	1	ZT35-50	DELAY LINE	DIL 50NS 350 OHM	18757	968600340
DL	2	ZT35-50	DELAY LINE	DIL 50NS 350 OHM	18757	968600340
DL	3	ZT35-50	DELAY LINE	DIL 50NS 350 OHM	18757	968600340
E		47745	CONNECTOR	PV.TERMINAL	15176	911002450
E	1	1G401210-1	P3620A PC BOARD	CLOCK DISTRIBUTOR BOARD	ORGNL	971121010
E	2	R76J-CRP-04	CARD PULLER CRP-04		17194	270031490
E	3	R76J-CRP-04	CARD PULLER CRP-04		17194	270031490
FL	3	DSS31055D223	NOISE FILTER	7A 50V 22UF	16551	856400210
J	1	3429-1002LCS	CONNECTOR	PIN HEADER 20P	12017	911102510
J	2	3429-1002LCS	CONNECTOR	PIN HEADER 20P	12017	911102510
J	3	3429-1002LCS	CONNECTOR	PIN HEADER 20P	12017	911102510
P	1	65039-035	CONNECTOR	LATCH HOUSING 2P	15176	911002460
P	2	65039-035	CONNECTOR	LATCH HOUSING 2P	15176	911002460
P	3	65039-035	CONNECTOR	LATCH HOUSING 2P	15176	911002460
P	4	65039-035	CONNECTOR	LATCH HOUSING 2P	15176	911002460
P	5	65039-035	CONNECTOR	LATCH HOUSING 2P	15176	911002460
P	6	65039-035	CONNECTOR	LATCH HOUSING 2P	15176	911002460
Q	1	2SC1509-RS	TSTR:SI NPN	PC:750MW FT:120MHZ	29256	764150910

CLOCK DISTRIBUTOR DWG NO 4G204324

REF	NO	PART NO	DESCRIPTION		MFR/DBR	CODE-NO
R	1	ET6X104	R:VAR CERMET	100K OHM 20% 1/2W	12001	819998182
R	2	ET6X104	R:VAR CERMET	100K OHM 20% 1/2W	12001	819998182
R	3	ET6X104	R:VAR CERMET	100K OHM 20% 1/2W	12001	819998182
R	4	ET6X501	R:VAR CERMET	500 OHM 20% 1/2W	12001	819998175
R	5	EXBP88102K	R:NETWORK	1K OHM X8 10% 1/8W	29861	809990420
R	6	EXBP88102K	R:NETWORK	1K OHM X8 10% 1/8W	29861	809990420
R	7	EXBP88102K	R:NETWORK	1K OHM X8 10% 1/8W	29861	809990420
R	11	ERO25CKF2213	R:FXD MET FLM	221K OHM 1% 1/4W	29866	806623221
R	12	ERO25CKF2213	R:FXD MET FLM	221K OHM 1% 1/4W	29866	806623221
R	13	ERO25CKF2213	R:FXD MET FLM	221K OHM 1% 1/4W	29866	806623221
R	14	ERO25CKF8250	R:FXD MET FLM	825 OHM 1% 1/4W	29866	806620825
R	15	ERO25CKF2003	R:FXD MET FLM	200K OHM 1% 1/4W	29866	806623200
R	16	ERO25CKF2003	R:FXD MET FLM	200K OHM 1% 1/4W	29866	806623200
R	17	ERO25CKF2003	R:FXD MET FLM	200K OHM 1% 1/4W	29866	806623200
R	21	ERD25TJ220V	R:FXD CARBON	22 OHM 5% 1/4W	29866	807320220
R	22	ERO25CKF8250	R:FXD MET FLM	825 OHM 1% 1/4W	29866	806620825
R	23	ERO25CKF8250	R:FXD MET FLM	825 OHM 1% 1/4W	29866	806620825
R	24	ERO25CKF2001	R:FXD MET FLM	2K OHM 1% 1/4W	29866	806621200
R	25	ERO25CKF9090	R:FXD MET FLM	909 OHM 1% 1/4W	29866	806620909
R	26	ERO25CKF2001	R:FXD MET FLM	2K OHM 1% 1/4W	29866	806621200
R	31	ERD25TJ220V	R:FXD CARBON	22 OHM 5% 1/4W	29866	807320220
R	32	ERO25CKF8250	R:FXD MET FLM	825 OHM 1% 1/4W	29866	806620825
R	33	ERO25CKF8250	R:FXD MET FLM	825 OHM 1% 1/4W	29866	806620825
R	34	ERO25CKF2001	R:FXD MET FLM	2K OHM 1% 1/4W	29866	806621200
R	35	ERO25CKF2001	R:FXD MET FLM	2K OHM 1% 1/4W	29866	806621200
R	39	ERD25TJ471V	R:FXD CARBON	470 OHM 5% 1/4W	29866	807321470
R	41	ERD25TJ220V	R:FXD CARBON	22 OHM 5% 1/4W	29866	807320220
R	42	ERO25CKF8250	R:FXD MET FLM	825 OHM 1% 1/4W	29866	806620825
R	43	ERO25CKF8250	R:FXD MET FLM	825 OHM 1% 1/4W	29866	806620825
R	44	ERO25CKF2001	R:FXD MET FLM	2K OHM 1% 1/4W	29866	806621200
R	45	ERO25CKF2001	R:FXD MET FLM	2K OHM 1% 1/4W	29866	806621200
R	49	ERD25TJ471V	R:FXD CARBON	470 OHM 5% 1/4W	29866	807321470
R	59	ERD25TJ101V	R:FXD CARBON	100 OHM 5% 1/4W	29866	807321100
R	61	ERD25TJ331V	R:FXD CARBON	330 OHM 5% 1/4W	29866	807321330
R	62	ERD25TJ331V	R:FXD CARBON	330 OHM 5% 1/4W	29866	807321330
U	9	SN74LS02N	IC:TTL LS	QUAD 2-INPUT NOR GATE	14558	640740220
U	13	SN74LS174N	IC:TTL LS	HEX D-TYPE FLIP-FLOP	14558	647417420
U	14	SN74LS112N	IC:TTL LS	DUAL J-K FLIP-FLOP	14558	647411220
U	15	SN74S64N	IC:TTL S	4-2-3-2 INPUT AOI	14558	640746410
U	16	SN74S74N	IC:TTL S	DUAL D-TYPE FLIP-FLOP	14558	640747410
U	17	SN74S74N	IC:TTL S	DUAL D-TYPE FLIP-FLOP	14558	640747410
U	18	SN74LS74AN	IC:TTL LS	DUAL D-TYPE FLIP-FLOP	14558	640747420
U	19	SN74S74N	IC:TTL S	DUAL D-TYPE FLIP-FLOP	14558	640747410
U	21	UPC157C	IC:OP AMP		12167	620015710
U	22	DAC08CQ	IC:LINEAR	D/A CONVERTER	10204	639990490
U	23	DAC08CQ	IC:LINEAR	D/A CONVERTER	10204	639990490
U	33	SN74LS374N	IC:TTL LS	OCTAL D-TYPE FLIP-FLOP	14558	647437420
U	24	DAC08CQ	IC:LINEAR	D/A CONVERTER	10204	639990490
U	24	SN74S51N	IC:TTL S	DUAL 2-WIDE 2-INPUT AOI	14558	640745110
U	25	SN74S64N	IC:TTL S	4-2-3-2 INPUT AOI	14558	640746410
U	26	SN74LS00N	IC:TTL LS	QUAD 2-INPUT NAND GATE	14558	640740020
U	27	SN74S74N	IC:TTL S	DUAL D-TYPE FLIP-FLOP	14558	640747410
U	28	SN74LS74AN	IC:TTL LS	DUAL D-TYPE FLIP-FLOP	14558	640747420
U	29	SN74S74N	IC:TTL S	DUAL D-TYPE FLIP-FLOP	14558	640747410
U	31	UPC157C	IC:OP AMP		12167	620015710
U	33	SN74LS374N	IC:TTL LS	OCTAL D-TYPE FLIP-FLOP	14558	647437420
U	34	SN74S64N	IC:TTL S	4-2-3-2 INPUT AOI	14558	640746410
U	35	SN74S64N	IC:TTL S	4-2-3-2 INPUT AOI	14558	640746410
U	36	SN74LS112N	IC:TTL LS	DUAL J-K FLIP-FLOP	14558	647411220

CLOCK DISTRIBUTOR DWG NO 4G204324

REF NO	PART NO	DESCRIPTION		MFR/DBR	CODE-NO
U 38	SN74LS244N	IC:TTL LS	OCTAL BUFFER 3-STATE	14558	647424420
U 39	SN74LS244N	IC:TTL LS	OCTAL BUFFER 3-STATE	14558	647424420
U 41	UPC157C	IC:OP AMP		12167	620015710
U 43	SN74LS374N	IC:TTL LS	OCTAL D-TYPE FLIP-FLOP	14558	647437420
U 44	SN74S64N	IC:TTL S	4-2-3-2 INPUT AOI	14558	640746410
U 45	SN74S11N	IC:TTL S	TRIPLE 3-INPUT NAND GATE	14558	640741110
U 46	SN74S04N	IC:TTL S	HEX INVERTER	14558	640740410
U 48	SN74LS244N	IC:TTL LS	OCTAL BUFFER 3-STATE	14558	647424420
U 49	SN74LS244N	IC:TTL LS	OCTAL BUFFER 3-STATE	14558	647424420
U 51	SN74S64N	IC:TTL S	4-2-3-2 INPUT AOI	14558	640746410
U 52	SN74S64N	IC:TTL S	4-2-3-2 INPUT AOI	14558	640746410
U 53	SN74LS374N	IC:TTL LS	OCTAL D-TYPE FLIP-FLOP	14558	647437420
U 54	SN74S08N	IC:TTL S	QUAD 2-INPUT AND GATE	14558	640740810
U 55	SN74LS00N	IC:TTL LS	QUAD 2-INPUT NAND GATE	14558	640740020
U 56	SN74S241N	IC:TTL S	OCTAL BUFFERS	14558	647424110
U 58	SN74S374N	IC:TTL S	OCTAL D-TYPE FLIP-FLOP	14558	647437410
U 59	SN74S374N	IC:TTL S	OCTAL D-TYPE FLIP-FLOP	14558	647437410
U 61	SN74S04N	IC:TTL S	HEX INVERTER	14558	640740410
U 62	SN74LS368N	IC:TTL LS	HEX INV BUS DRVR 3-STATE	14558	647436820
U 63	SN74LS174N	IC:TTL LS	HEX D-TYPE FLIP-FLOP	14558	647417420
U 64	SN74S86N	IC:TTL S	QUAD EXCLUSIVE OR GATE	14558	640748610
U 65	SN74LS04N	IC:TTL LS	HEX INVERTER	14558	640740420
U 66	SN74S241N	IC:TTL S	OCTAL BUFFERS	14558	647424110
U 67	SN74S175N	IC:TTL S	QUAD D-TYPE FLIP-FLOP	14558	647417510
U 68	SN74S174N	IC:TTL S	HEX D-TYPE FLIP-FLOP	14558	647417410
U 69	SN74S174N	IC:TTL S	HEX D-TYPE FLIP-FLOP	14558	647417410

TRIGGER DETECTOR DWG NO 4G204325

REF NO	PART NO	DESCRIPTION		MFR/DBR	CODE-NO
C 1	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C 2	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C 3	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C 4	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C 5	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C 6	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C 7	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C 8	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C 9	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C 31	ECCW1H100F5	C:FXD CER TC	10PF +-1.0PF 50V SL	29897	822000609
C 41	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C 61	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C 62	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C 63	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C 64	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C 65	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C 66	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C 67	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C 68	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C 69	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C 70	ECEB1CS101	C:FXD AL ELECT	100UF +30%-10% 16V	29880	820088350
E 1	1G401211-1	P3620A PC BOARD	TRIGGER DETECTOR BOARD	ORGNL	971121110
E 2	R76J-CRP-04	CARD PULLER CRP-04		17194	270031490
E 3	R76J-CRP-04	CARD PULLER CRP-04		17194	270031490
R 1	ERD25TJ101V	R:FXD CARBON	100 OHM 5% 1/4W	29866	807321100
R 2	ERD25TJ101V	R:FXD CARBON	100 OHM 5% 1/4W	29866	807321100
U 1	SN74LS490N	IC:TTL LS	DUAL DECADE COUNTER	14558	647449020
U 2	SN74LS74AN	IC:TTL LS	DUAL D-TYPE FLIP-FLOP	14558	640747420
U 3	SN74LS00N	IC:TTL LS	QUAD 2-INPUT NAND GATE	14558	640740020
U 4	SN74LS08N	IC:TTL LS	QUAD 2-INPUT AND GATE	14558	640740820
U 5	SN74S10N	IC:TTL S	TRIPLE 3-INPUT NAND GATE	14558	640741010
U 6	SN74S74N	IC:TTL S	DUAL D-TYPE FLIP-FLOP	14558	640747410
U 7	SN74S08N	IC:TTL S	QUAD 2-INPUT AND GATE	14558	640740810
U 8	SN74S74N	IC:TTL S	DUAL D-TYPE FLIP-FLOP	14558	640747410
U 9	SN74S175N	IC:TTL S	QUAD D-TYPE FLIP-FLOP	14558	647417510
U 11	SN74LS490N	IC:TTL LS	DUAL DECADE COUNTER	14558	647449020
U 12	SN74LS390N	IC:TTL LS	DUAL DECADE COUNTER	14558	647439020
U 13	SN74LS20N	IC:TTL LS	DUAL 4-INPUT NAND GATE	14558	640742020
U 14	SN74LS04N	IC:TTL LS	HEX INVERTER	14558	640740420
U 15	SN74LS00N	IC:TTL LS	QUAD 2-INPUT NAND GATE	14558	640740020
U 16	SN74S64N	IC:TTL S	4-2-3-2 INPUT AOI	14558	640746410
U 17	SN74S64N	IC:TTL S	4-2-3-2 INPUT AOI	14558	640746410
U 18	SN74S64N	IC:TTL S	4-2-3-2 INPUT AOI	14558	640746410
U 19	SN74S64N	IC:TTL S	4-2-3-2 INPUT AOI	14558	640746410
U 21	SN74S112N	IC:TTL S	DUAL J-K FLIP-FLOP	14558	647411210
U 22	SN74S151N	IC:TTL S	1-OF-8 DATA SELECTOR	14558	647415110
U 23	SN74S64N	IC:TTL S	4-2-3-2 INPUT AOI	14558	640746410
U 24	SN74S175N	IC:TTL S	QUAD D-TYPE FLIP-FLOP	14558	647417510
U 25	SN74LS158N	IC:TTL LS	QUAD 2-TO-1 LINE SELECT	14558	647415820
U 26	SN74S10N	IC:TTL S	TRIPLE 3-INPUT NAND GATE	14558	640741010
U 27	SN74S10N	IC:TTL S	TRIPLE 3-INPUT NAND GATE	14558	640741010

TRIGGER DETECTOR DWG NO 4G204325

REF NO	PART NO	DESCRIPTION		MFR/DBR	CODE-NO
U 28	SN74S20N	IC:TTL S	DUAL 4-INPUT NAND GATE	14558	640742010
U 29	SN74S20N	IC:TTL S	DUAL 4-INPUT NAND GATE	14558	640742010
U 32	SN74LS174N	IC:TTL LS	HEX D-TYPE FLIP-FLOP	14558	647417420
U 33	SN74S08N	IC:TTL S	QUAD 2-INPUT AND GATE	14558	640740810
U 34	SN74S112N	IC:TTL S	DUAL J-K FLIP-FLOP	14558	647411210
U 35	AM27S07PC	IC:TTL S	16X4 STATIC RAM	10001	659990340
U 36	AM27S07PC	IC:TTL S	16X4 STATIC RAM	10001	659990340
U 37	AM27S07PC	IC:TTL S	16X4 STATIC RAM	10001	659990340
U 38	AM27S07PC	IC:TTL S	16X4 STATIC RAM	10001	659990340
U 39	AM27S07PC	IC:TTL S	16X4 STATIC RAM	10001	659990340
U 41	M5L8224P	IC:N MOS	CLOCK GENERATOR	17960	602110360
U 42	SN74LS175N	IC:TTL LS	QUAD D-TYPE FLIP-FLOP	14558	647417520
U 43	SN74S74N	IC:TTL S	DUAL D-TYPE FLIP-FLOP	14558	640747410
U 44	SN74S112N	IC:TTL S	DUAL J-K FLIP-FLOP	14558	647411210
U 45	SN74S00N	IC:TTL S	QUAD 2-INPUT NAND GATE	14558	640740010
U 46	AM27S07PC	IC:TTL S	16X4 STATIC RAM	10001	659990340
U 47	AM27S07PC	IC:TTL S	16X4 STATIC RAM	10001	659990340
U 48	AM27S07PC	IC:TTL S	16X4 STATIC RAM	10001	659990340
U 49	AM27S07PC	IC:TTL S	16X4 STATIC RAM	10001	659990340
U 51	AM74S161N	IC:TTL S	SYNC. 4BIT BIN-COUNTER	10001	659990350
U 52	SN74S85N	IC:TTL S	4BIT MAGNITUDE COMP.	14558	640748510
U 53	SN74S04N	IC:TTL S	HEX INVERTER	14558	640740410
U 54	SN74LS32N	IC:TTL LS	QUAD 2 INPUT OR GATE	14558	640743220
U 55	SN74S32N	IC:TTL S	QUAD 2-INPUT OR GATE	14558	640743210
U 56	SN74S157N	IC:TTL S	QUAD 2-TO-1 LINE SELECT	14558	647415710
U 57	SN74S157N	IC:TTL S	QUAD 2-TO-1 LINE SELECT	14558	647415710
U 58	SN74S157N	IC:TTL S	QUAD 2-TO-1 LINE SELECT	14558	647415710
U 59	SN74S157N	IC:TTL S	QUAD 2-TO-1 LINE SELECT	14558	647415710
U 61	SN74S153N	IC:TTL S	DUAL 4TO1 LINE SELECTOR	14558	647415310
U 62	SN74S51N	IC:TTL S	DUAL 2-WIDE 2-INPUT AOI	14558	640745110
U 63	SN74LS244N	IC:TTL LS	OCTAL BUFFER 3-STATE	14558	647424420
U 64	SN74LS32N	IC:TTL LS	QUAD 2 INPUT OR GATE	14558	640743220
U 65	SN74S157N	IC:TTL S	QUAD 2-TO-1 LINE SELECT	14558	647415710
U 66	SN74S157N	IC:TTL S	QUAD 2-TO-1 LINE SELECT	14558	647415710
U 67	SN74S157N	IC:TTL S	QUAD 2-TO-1 LINE SELECT	14558	647415710
U 68	SN74S157N	IC:TTL S	QUAD 2-TO-1 LINE SELECT	14558	647415710
U 69	SN74S157N	IC:TTL S	QUAD 2-TO-1 LINE SELECT	14558	647415710
Y 1	KMP200	CRYSTAL:QUARTZ OSC	20MHZ	11357	893004700

OPTION 1 DWG NO 4G204330

REF NO	PART NO	DESCRIPTION		MFR/DER	CODE-NO
C 1	ECEB1CS470	C:FXD AL ELECT	47UF +30%-10% 16V	29880	820088340
C 2	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C 3	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C 4	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C 5	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C 6	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C 7	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C 8	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C 9	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C 10	ECKW1H102KB5	C:FXD CER HI-K	1000PF +-10% 50V	29897	822000109
C 11	ECKW1H821KB5	C:FXD CER HI-K	820PF +-10% 50V	29897	822000108
C 12	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C 13	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
E 1	1G401221	P3620A PC BOARD	OPTION 1	ORGNL	971122100
E 2	R76J-CRP-04	CARD PULLER CRP-04		17194	270031490
E 3	R76J-CRP-04	CARD PULLER CRP-04		17194	270031490
FL 1	DSS31055D223	NOISE FILTER	7A 50V 22UF	16551	856400210
J 1	3433-1002LCS	CONNECTOR	HEADER 50P	12017	911102570
J 2	3433-1002LCS	CONNECTOR	HEADER 50P	12017	911102570
R 1	EXBP84103K	R:NETWORK	10K OHM X4 10% 1/8W	29861	809990500
R 2	EXBP88562K	R:NETWORK	5.6K OHM X8 10% 1/8W	29861	809990570
U 1	UPD4016C1	IC:N MOS	2K X8 STATIC RAM 250NS	12167	610401610
U 2	UPD4016C1	IC:N MOS	2K X8 STATIC RAM 250NS	12167	610401610
U 3	UPD4016C1	IC:N MOS	2K X8 STATIC RAM 250NS	12167	610401610
U 4	UPD4016C1	IC:N MOS	2K X8 STATIC RAM 250NS	12167	610401610
U 5	SN74LS20N	IC:TTL LS	DUAL 4-INPUT NAND GATE	14558	640742020
U 6	SN74LS138N	IC:TTL LS	3-TO-8 LINE DECODER	14558	647413820
U 7	SN74LS244N	IC:TTL LS	OCTAL BUFFER 3-STATE	14558	647424420
U 10	SN74S51N	IC:TTL S	DUAL 2-WIDE 2-INPUT AOI	14558	640745110
U 22	SN74LS244N	IC:TTL LS	OCTAL BUFFER 3-STATE	14558	647424420
U 23	SN74LS244N	IC:TTL LS	OCTAL BUFFER 3-STATE	14558	647424420
U 24	SN74LS245N	IC:TTL LS	OCTAL BUS TRANCEIVER 3S	14558	647424520
U 25	SN74LS244N	IC:TTL LS	OCTAL BUFFER 3-STATE	14558	647424420
U 26	SN74LS10N	IC:TTL LS	TRIPLE 3-INPUT NAND GATE	14558	640741020
U 27	SN74LS04N	IC:TTL LS	HEX INVERTER	14558	640740420
U 28	SN74LS00N	IC:TTL LS	QUAD 2-INPUT NAND GATE	14558	640740020
U 29	SN74LS10N	IC:TTL LS	TRIPLE 3-INPUT NAND GATE	14558	640741020
U 30	SN74LS139N	IC:TTL LS	DUAL 2-TO-4 LINE DECODER	14558	647413920
U 31	SN74LS04N	IC:TTL LS	HEX INVERTER	14558	640740420
XU 1	JC4624-11	IC SOCKET	24-PIN DIL	14558	903400540
XU 2	JC4624-11	IC SOCKET	24-PIN DIL	14558	903400540
XU 3	JC4624-11	IC SOCKET	24-PIN DIL	14558	903400540
XU 4	JC4624-11	IC SOCKET	24-PIN DIL	14558	903400540

MOTHER BOARD DWG NO 46204326

REF	NO		PART NO	DESCRIPTION		MFR/DBR	CODE-NO
E	1		1G401212-1	P3620A PC BOARD	MOTHER BOARD	ORGNL	971121210
E	2		170001-2	CONNECTOR	FAST-ON 187 TAB	14441	911102050
E	3		170001-2	CONNECTOR	FAST-ON 187 TAB	14441	911102050
E	4		170001-2	CONNECTOR	FAST-ON 187 TAB	14441	911102050
E	5		170001-2	CONNECTOR	FAST-ON 187 TAB	14441	911102050
E	6		170001-2	CONNECTOR	FAST-ON 187 TAB	14441	911102050
E	7		170001-2	CONNECTOR	FAST-ON 187 TAB	14441	911102050
E	8		170001-2	CONNECTOR	FAST-ON 187 TAB	14441	911102050
E	9		170001-2	CONNECTOR	FAST-ON 187 TAB	14441	911102050
E	10		170001-2	CONNECTOR	FAST-ON 187 TAB	14441	911102050
E	11		170001-2	CONNECTOR	FAST-ON 187 TAB	14441	911102050
E	12		170001-2	CONNECTOR	FAST-ON 187 TAB	14441	911102050
E	21		R76M-NSC4-3	RIVET NSC4-3		14009	263030180
E	22		R76M-NSC4-3	RIVET NSC4-3		14009	263030180
E	23		R76M-NSC4-3	RIVET NSC4-3		14009	263030180
E	24		R76M-NSC4-3	RIVET NSC4-3		14009	263030180
E	25		R76M-NSC4-3	RIVET NSC4-3		14009	263030180
E	26		R76M-NSC4-3	RIVET NSC4-3		14009	263030180
E	27		R76M-NSC4-3	RIVET NSC4-3		14009	263030180
E	28		R76M-NSC4-3	RIVET NSC4-3		14009	263030180
E	29		R76M-NSC4-3	RIVET NSC4-3		14009	263030180
E	30		R76M-NSC4-3	RIVET NSC4-3		14009	263030180
E	31		R76M-NSC4-3	RIVET NSC4-3		14009	263030180
E	41		170038-4	CONNECTOR	FAST-ON 187 RECEPT	14441	911102040
E	42		170038-4	CONNECTOR	FAST-ON 187 RECEPT	14441	911102040
E	43		170038-4	CONNECTOR	FAST-ON 187 RECEPT	14441	911102040
E	44		170038-4	CONNECTOR	FAST-ON 187 RECEPT	14441	911102040
E	45		170038-4	CONNECTOR	FAST-ON 187 RECEPT	14441	911102040
E	46		170038-4	CONNECTOR	FAST-ON 187 RECEPT	14441	911102040
E	47		170038-4	CONNECTOR	FAST-ON 187 RECEPT	14441	911102040
E	48		170038-4	CONNECTOR	FAST-ON 187 RECEPT	14441	911102040
E	49		170038-4	CONNECTOR	FAST-ON 187 RECEPT	14441	911102040
E	50		170038-4	CONNECTOR	FAST-ON 187 RECEPT	14441	911102040
E	51		170038-4	CONNECTOR	FAST-ON 187 RECEPT	14441	911102040
E	52		170038-4	CONNECTOR	FAST-ON 187 RECEPT	14441	911102040
E	53		170038-4	CONNECTOR	FAST-ON 187 RECEPT	14441	911102040
E	54		170038-4	CONNECTOR	FAST-ON 187 RECEPT	14441	911102040
E	55		170038-4	CONNECTOR	FAST-ON 187 RECEPT	14441	911102040
E	56		170038-4	CONNECTOR	FAST-ON 187 RECEPT	14441	911102040
E	57		170038-4	CONNECTOR	FAST-ON 187 RECEPT	14441	911102040
E	58		170038-4	CONNECTOR	FAST-ON 187 RECEPT	14441	911102040
E	59		170038-4	CONNECTOR	FAST-ON 187 RECEPT	14441	911102040
E	60		170038-4	CONNECTOR	FAST-ON 187 RECEPT	14441	911102040
E	61		170038-4	CONNECTOR	FAST-ON 187 RECEPT	14441	911102040
E	62		170038-4	CONNECTOR	FAST-ON 187 RECEPT	14441	911102040
J	1		H431121-36	CONNECTOR:EDGE	36P DOUBLE	14558	911102280
J	2		H431121-36	CONNECTOR:EDGE	36P DOUBLE	14558	911102280
J	3		H431121-36	CONNECTOR:EDGE	36P DOUBLE	14558	911102280
J	4		H431121-36	CONNECTOR:EDGE	36P DOUBLE	14558	911102280
J	5		H431121-36	CONNECTOR:EDGE	36P DOUBLE	14558	911102280
J	6		H431121-36	CONNECTOR:EDGE	36P DOUBLE	14558	911102280
J	7		H431121-36	CONNECTOR:EDGE	36P DOUBLE	14558	911102280
J	8		H431121-36	CONNECTOR:EDGE	36P DOUBLE	14558	911102280
J	9		H431121-36	CONNECTOR:EDGE	36P DOUBLE	14558	911102280
J	10		H431121-36	CONNECTOR:EDGE	36P DOUBLE	14558	911102280
J	11		H431121-36	CONNECTOR:EDGE	36P DOUBLE	14558	911102280
J	12		H431121-36	CONNECTOR:EDGE	36P DOUBLE	14558	911102280
J	13		H431121-36	CONNECTOR:EDGE	36P DOUBLE	14558	911102280
J	14		H431121-36	CONNECTOR:EDGE	36P DOUBLE	14558	911102280
J	15		H431121-36	CONNECTOR:EDGE	36P DOUBLE	14558	911102280
J	16		H431121-36	CONNECTOR:EDGE	36P DOUBLE	14558	911102280
J	21		M3305P03	CONNECTOR:PIN	5P ANGLE	16368	911002400
J	22		M3310P01	CONNECTOR:PIN	10P STRAIGHT	16368	911002000
P	1	1	M3305S21	CONNECTOR:PIN	5P L=100	16368	911002240

CRT DISPLAY DWG NO 4G204328

REF NO	PART NO	DESCRIPTION		MFR/DBR	CODE-NO
C 1	ECQM1H223KZ	C:FXD FLM	0.022UF 10% 50V	26550	825132240
C 2	ECQM1H223KZ	C:FXD FLM	0.022UF 10% 50V	26550	825132240
C 3	ECQM1H104KZ	C:FXD FLM	0.1UF 10% 50V	26550	825141040
C 4	ECQM1H104KZ	C:FXD FLM	0.1UF 10% 50V	26550	825141040
C 5	ECSZ16V510	C:FXD TA ELECT	10UF 20% 16V	29880	820743130
C 6	ECEA1CS470	C:FXD AL ELECT	47UF +30%-10% 16V	29880	820018340
C 7	ECSZ16V510	C:FXD TA ELECT	10UF 20% 16V	29880	820743130
C 8	ECEA1CS101	C:FXD AL ELECT	100UF +30%-10% 16V	29880	820018350
C 9	ECEA1CS471	C:FXD AL ELECT	470UF +30%-10% 16V	29880	820018380
C 10	ECQM1H683KZ	C:FXD FLM	0.068UF 10% 50V	26550	825136840
C 21	ECEA1CS471	C:FXD AL ELECT	470UF +30%-10% 16V	29880	820018380
C 22	ECEA1HS2R2	C:FXD AL ELECT	2.2UF +30%-10% 50V	29880	820018820
C 41	ECEA1VS470	C:FXD AL ELECT	47UF +30%-10% 35V	29880	820018700
C 42	ECCW1H151K5	C:FXD CER TC	150PF +-10% 50V SL	29897	822000623
C 43	ECCW1H101K5	C:FXD CER TC	100PF +-10% 50V SL	29897	822000621
C 44	ECCW1H471K5	C:FXD CER TC	470PF +-10% 50V SL	29897	822000629
C 45	ECKW1H102KB5	C:FXD CER HI-K	1000PF +-10% 50V	29897	822000109
C 46	ECEA1CS100	C:FXD AL ELECT	10UF +30%-10% 16V	29880	820018310
C 47	ECQM4472KZ	C:FXD FLM	4700PF 10% 400V	26550	825262470
C 49	ECQM4183KZ	C:FXD FLM	0.018UF 10% 400V	26550	825263180
C 51	ECEA1CS100	C:FXD AL ELECT	10UF +30%-10% 16V	29880	820018310
C 52	ECQM1H222KZ	C:FXD FLM	2000PF 10% 50V	26550	825122240
C 81	ECCW1H100F5	C:FXD CER TC	10PF +-1.0PF 50V SL	29897	822000609
C 82	ECKW1H103ZF5	C:FXD CER HI-K	10000PF +80-20% 50V	29897	822000133
C 83	ECCW1H101K5	C:FXD CER TC	100PF +-10% 50V SL	29897	822000621
C 84	ECKW1H103ZF5	C:FXD CER HI-K	10000PF +80-20% 50V	29897	822000133
C 85	ECQM1H473KZ	C:FXD FLM	0.047UF 10% 50V	26550	825134740
C 86	ECQM1H103KZ	C:FXD FLM	0.01UF 10% 50V	26550	825131040
C 87	ECEA1VS470	C:FXD AL ELECT	47UF +30%-10% 35V	29880	820018700
C 88	ECQM4223KZ	C:FXD FLM	0.022UF 10% 400V	26550	825263220
C 89	ECQM4473KZ	C:FXD FLM	0.047UF 10% 400V	26550	825263470
C 110	ECKW2H472PE8	C:FXD CER HI-K	4700PF +100-0% 500V	29897	823552180
C 111	ECEA2CS3R3	C:FXD AL ELECT	3.3UF +30%-10% 160V	29880	820019030
C 112	ECEA2CS3R3	C:FXD AL ELECT	3.3UF +30%-10% 160V	29880	820019030
C 121	ECQM4223KZ	C:FXD FLM	0.022UF 10% 400V	26550	825263220
C 130	ECQE6223KZ	C:FXD FLM	0.022UF 10% 600V	26550	825702000
C 141	ECEA1CS101	C:FXD AL ELECT	100UF +30%-10% 16V	29880	820018350
C 142	ECEA1CS101	C:FXD AL ELECT	100UF +30%-10% 16V	29880	820018350
CR 1	MA150TA	DIODE:SI	100MA 35V	29256	773150010
CR 2	MA150TA	DIODE:SI	100MA 35V	29256	773150010
CR 3	MA150TA	DIODE:SI	100MA 35V	29256	773150010
CR 4	MA150TA	DIODE:SI	100MA 35V	29256	773150010
CR 41	MA150TA	DIODE:SI	100MA 35V	29256	773150010
CR 42	MA150TA	DIODE:SI	100MA 35V	29256	773150010
CR 43	MA150TA	DIODE:SI	100MA 35V	29256	773150010
CR 44	MA150TA	DIODE:SI	100MA 35V	29256	773150010
CR 45	MA150TA	DIODE:SI	100MA 35V	29256	773150010
CR 46	S3V60	DIODE:PWR RECT	3.5A 600V	12353	772001460
CR 47	MA150TA	DIODE:SI	100MA 35V	29256	773150010
CR 48	MA150TA	DIODE:SI	100MA 35V	29256	773150010
CR 49	MA150TA	DIODE:SI	100MA 35V	29256	773150010
CR 81	MA150TA	DIODE:SI	100MA 35V	29256	773150010

CRT DISPLAY DWG NO 4G204328

REF NO	PART NO	DESCRIPTION		MFR/DBR	CODE-NO
CR 82	MA150TA	DIODE:SI	100MA 35V	29256	773150010
CR 83	MA150TA	DIODE:SI	100MA 35V	29256	773150010
CR 84	MA150TA	DIODE:SI	100MA 35V	29256	773150010
CR 85	MA150TA	DIODE:SI	100MA 35V	29256	773150010
CR 86	S3V60	DIODE:PWR RECT	3.5A 600V	12353	772001460
CR 110	V06E	DIODE:SI	1.1A 600V	14458	772000940
CR 121	V06E	DIODE:SI	1.1A 600V	14458	772000940
CR 130	SF1	DIODE:SWITCHING	300MA 1500V	12180	772000320
E 1	2G401242-1	P3620A PC BOARD	CRT DISPLAY BOARD	ORGNL	972124210
E 2	170001-2	CONNECTOR	FAST-ON 187 TAB	14441	911102050
E 3	170001-2	CONNECTOR	FAST-ON 187 TAB	14441	911102050
E 4	170001-2	CONNECTOR	FAST-ON 187 TAB	14441	911102050
E 5	170001-2	CONNECTOR	FAST-ON 187 TAB	14441	911102050
E 6	170001-2	CONNECTOR	FAST-ON 187 TAB	14441	911102050
E 7	170001-2	CONNECTOR	FAST-ON 187 TAB	14441	911102050
E 8	170001-2	CONNECTOR	FAST-ON 187 TAB	14441	911102050
E 11	R76M-NSC4-3	RIVET NSC4-3		14009	263030180
E 12	R76M-NSC4-3	RIVET NSC4-3		14009	263030180
E 13	R76M-NSC4-3	RIVET NSC4-3		14009	263030180
E 14	R76M-NSC4-3	RIVET NSC4-3		14009	263030180
E 15	R76M-NSC4-3	RIVET NSC4-3		14009	263030180
E 16	R76M-NSC4-3	RIVET NSC4-3		14009	263030180
E 17	R76M-NSC4-3	RIVET NSC4-3		14009	263030180
E 21	170038-4	CONNECTOR	FAST-ON 187 RECEPT	14441	911102040
E 22	170038-4	CONNECTOR	FAST-ON 187 RECEPT	14441	911102040
E 23	170038-4	CONNECTOR	FAST-ON 187 RECEPT	14441	911102040
E 24	170038-4	CONNECTOR	FAST-ON 187 RECEPT	14441	911102040
E 25	170038-4	CONNECTOR	FAST-ON 187 RECEPT	14441	911102040
E 26	170038-4	CONNECTOR	FAST-ON 187 RECEPT	14441	911102040
E 27	170038-4	CONNECTOR	FAST-ON 187 RECEPT	14441	911102040
E 28	170038-4	CONNECTOR	FAST-ON 187 RECEPT	14441	911102040
E 29	170038-4	CONNECTOR	FAST-ON 187 RECEPT	14441	911102040
E 30	170038-4	CONNECTOR	FAST-ON 187 RECEPT	14441	911102040
E 31	170038-4	CONNECTOR	FAST-ON 187 RECEPT	14441	911102040
E 32	170038-4	CONNECTOR	FAST-ON 187 RECEPT	14441	911102040
J 1	M3305P01	CONNECTOR:PIN	5P STRAIGHT	16368	911001990
J 2	EMCS1050	CONNECTOR	10P L=500MM	29850	911002600
J 3	M3305P01	CONNECTOR:PIN	5P STRAIGHT	16368	911001990
J 4	65507-103	CONNECTOR:PIN	3P SINGLE 2.54PITCH	15176	911002520
L 81	4G431217	2240A COIL:CHOKE	200UH	ORGNL	857412170
L 82	EL810SK1100K	COIL:CHOKE	10UH 10%	13977	858220100
Q 1	2SC828A-RS	TSTR:SI NPN	PC:250MW FT:220MHZ	29256	762828120
Q 2	2SC828A-RS	TSTR:SI NPN	PC:250MW FT:220MHZ	29256	762828120
Q 3	2SC1328-ST	TSTR:SI NPN	PC:150MW FT:250MHZ	29256	764132810
Q 4	2SA564A-RS	TSTR:SI PNP	PC:250MW FT:80MHZ	29256	760564110
Q 5	2SC1328-ST	TSTR:SI NPN	PC:150MW FT:250MHZ	29256	764132810
Q 6	2SC1509-RS	TSTR:SI NPN	PC:750MW FT:120MHZ	29256	764150910
Q 7	2SA777-RS	TSTR:SI PNP	PC:750MW FT:120MHZ	29256	760777010

CRT DISPLAY DWG NO 4G204328

REF	NO	PART NO	DESCRIPTION		MFR/DBR	CODE-NO
Q	41	2SA699A-QR	TSTR:SI PNP	PC:10W FT:150MHZ	29256	760699130
Q	42	2SA699A-QR	TSTR:SI PNP	PC:10W FT:150MHZ	29256	760699130
Q	43	2SA777-RS	TSTR:SI PNP	PC:750MW FT:120MHZ	29256	760777010
Q	44	2SC828A-RS	TSTR:SI NPN	PC:250MW FT:220MHZ	29256	762828120
Q	45	2SC828A-RS	TSTR:SI NPN	PC:250MW FT:220MHZ	29256	762828120
Q	46	2SC828A-RS	TSTR:SI NPN	PC:250MW FT:220MHZ	29256	762828120
Q	47	2SC901A	TSTR:SI NPN	PC:50W FT:50MHZ	29256	762901100
Q	48	2SC1318-RS	TSTR:SI NPN	PC:400MW FT:200MHZ	29256	764131810
Q	49	2SD389-PQ	TSTR:SI NPN	PC:25W FT:25MHZ	29256	763389010
Q	81	2SC1359-AB	TSTR:SI NPN	PC:250MW FT:300MHZ	29256	764135910
Q	82	2SA838	TSTR:SI PNP	PC:250MW FT:300MHZ	29256	760838000
Q	83	2SC2258	TSTR:SI NPN	PC:1W FT:100MHZ	29256	764225800
Q	84	2SC828A-RS	TSTR:SI NPN	PC:250MW FT:220MHZ	29256	762828120
Q	85	2SC828A-RS	TSTR:SI NPN	PC:250MW FT:220MHZ	29256	762828120
Q	86	2SA777-RS	TSTR:SI PNP	PC:750MW FT:120MHZ	29256	760777010
Q	87	2SA699A-QR	TSTR:SI PNP	PC:10W FT:150MHZ	29256	760699130
Q	88	2SC901A	TSTR:SI NPN	PC:50W FT:50MHZ	29256	762901100
Q	89	2SD389-PQ	TSTR:SI NPN	PC:25W FT:25MHZ	29256	763389010
Q	110	2SC1573	TSTR:SI NPN	PC:600MW FT:80MHZ	29256	764157300
R	1	ERD25TJ103V	R:FXD CARBON	10K OHM 5% 1/4W	29866	807323100
R	2	ERD25TJ103V	R:FXD CARBON	10K OHM 5% 1/4W	29866	807323100
R	3	ERD25TJ562V	R:FXD CARBON	5.6K OHM 5% 1/4W	29866	807322560
R	4	ERD25TJ101V	R:FXD CARBON	100 OHM 5% 1/4W	29866	807321100
R	5	ERD25TJ561V	R:FXD CARBON	560 OHM 5% 1/4W	29866	807321560
R	6	ERD25TJ222V	R:FXD CARBON	2.2K OHM 5% 1/4W	29866	807322220
R	7	ERD25TJ102V	R:FXD CARBON	1K OHM 5% 1/4W	29866	807322100
R	8	ERD25TJ472V	R:FXD CARBON	4.7K OHM 5% 1/4W	29866	807322470
R	9	ET6X203	R:VAR CERMET	20K OHM 20% 1/2W	12001	819998180
R	10	ERD25TJ682V	R:FXD CARBON	6.8K OHM 5% 1/4W	29866	807322680
R	11	ERD25TJ563V	R:FXD CARBON	56K OHM 5% 1/4W	29866	807323560
R	13	ERD25TJ100V	R:FXD CARBON	10 OHM 5% 1/4W	29866	807320100
R	14	ERD50TJ3R3	R:FXD CARBON	3.3 OHM 5% 1/2W	29866	807428330
R	15	ERD25TJ472V	R:FXD CARBON	4.7K OHM 5% 1/4W	29866	807322470
R	16	ERD25TJ333V	R:FXD CARBON	33K OHM 5% 1/4W	29866	807323330
R	17	ERD25TJ682V	R:FXD CARBON	6.8K OHM 5% 1/4W	29866	807322680
R	18	ERD25TJ562V	R:FXD CARBON	5.6K OHM 5% 1/4W	29866	807322560
R	19	ERD25TJ820V	R:FXD CARBON	82 OHM 5% 1/4W	29866	807320820
R	20	ET6X501	R:VAR CERMET	500 OHM 20% 1/2W	12001	819998175
R	21	ERD25TJ152V	R:FXD CARBON	1.5K OHM 5% 1/4W	29866	807322150
R	22	ERD25TJ821V	R:FXD CARBON	820 OHM 5% 1/4W	29866	807321820
R	23	ERD25TJ471V	R:FXD CARBON	470 OHM 5% 1/4W	29866	807321470
R	24	ERD25TJ100V	R:FXD CARBON	10 OHM 5% 1/4W	29866	807320100
R	25	ERD50TJ3R3	R:FXD CARBON	3.3 OHM 5% 1/2W	29866	807428330
R	26	ERD50TJ3R3	R:FXD CARBON	3.3 OHM 5% 1/2W	29866	807428330
R	27	ERD25TJ331V	R:FXD CARBON	330 OHM 5% 1/4W	29866	807321330
R	28	ERD25TJ511V	R:FXD CARBON	510 OHM 5% 1/4W	29866	807321510
R	29	ERD25TJ103V	R:FXD CARBON	10K OHM 5% 1/4W	29866	807323100
R	41	ERX2ANJ2R2	R:FXD MET OXD	2.2 OHM 5% 2W	29861	808878170
R	42	ERF2AJR10	R:FXD WW CEMENT	0.1 OHM 5% 2W	29861	806347100
R	43	ERX2ANJ2R2	R:FXD MET OXD	2.2 OHM 5% 2W	29861	808878170
R	44	ERF2AJR10	R:FXD WW CEMENT	0.1 OHM 5% 2W	29861	806347100
R	45	ERG2ANG271	R:FXD MET OXD	270 OHM 2% 2W	29861	808821270
R	46	ET6X103	R:VAR CERMET	10K OHM 20% 1/2W	12001	819998179
R	47	ERD25TJ272V	R:FXD CARBON	2.7K OHM 5% 1/4W	29866	807322270
R	48	ERD25TJ153V	R:FXD CARBON	15K OHM 5% 1/4W	29866	807323150
R	49	ERD25TJ682V	R:FXD CARBON	6.8K OHM 5% 1/4W	29866	807322680
R	50	ERD25TJ180V	R:FXD CARBON	18 OHM 5% 1/4W	29866	807320180
R	51	ERD25TJ332V	R:FXD CARBON	3.3K OHM 5% 1/4W	29866	807322330
R	52	ERD25TJ101V	R:FXD CARBON	100 OHM 5% 1/4W	29866	807321100
R	53	ERD25TJ102V	R:FXD CARBON	1K OHM 5% 1/4W	29866	807322100
R	54	ERD25TJ103V	R:FXD CARBON	10K OHM 5% 1/4W	29866	807323100

CRT DISPLAY DWG NO 46204328

REF NO	PART NO	DESCRIPTION		MFR/DBR	CODE-NO
R 55	ERD25TJ103V	R:FXD CARBON	10K OHM 5% 1/4W	29866	807323100
R 56	ERD25TJ103V	R:FXD CARBON	10K OHM 5% 1/4W	29866	807323100
R 57	ET6X202	R:VAR CERMET	2K OHM 20% 1/2W	12001	819998177
R 58	ERD25TJ822V	R:FXD CARBON	8.2K OHM 5% 1/4W	29866	807322820
R 59	ERD25TJ682V	R:FXD CARBON	6.8K OHM 5% 1/4W	29866	807322680
R 60	ERD25TJ103V	R:FXD CARBON	10K OHM 5% 1/4W	29866	807323100
R 61	ERD25TJ332V	R:FXD CARBON	3.3K OHM 5% 1/4W	29866	807322330
R 62	ET6X102	R:VAR CERMET	1K OHM 20% 1/2W	12001	819998176
R 63	ERD25TJ103V	R:FXD CARBON	10K OHM 5% 1/4W	29866	807323100
R 64	ET6X203	R:VAR CERMET	20K OHM 20% 1/2W	12001	819998180
R 65	ERD25TJ333V	R:FXD CARBON	33K OHM 5% 1/4W	29866	807323330
R 66	ERD25TJ682V	R:FXD CARBON	6.8K OHM 5% 1/4W	29866	807322680
R 67	ERD25TJ104V	R:FXD CARBON	100K OHM 5% 1/4W	29866	807324100
R 68	ERD25TJ100V	R:FXD CARBON	10 OHM 5% 1/4W	29866	807320100
R 68	ERD25TJ472V	R:FXD CARBON	4.7K OHM 5% 1/4W	29866	807322470
R 69	ERD25TJ103V	R:FXD CARBON	10K OHM 5% 1/4W	29866	807323100
R 70	ERD25TJ100V	R:FXD CARBON	10 OHM 5% 1/4W	29866	807320100
R 81	ERD25TJ392V	R:FXD CARBON	3.9K OHM 5% 1/4W	29866	807322390
R 82	ERD25TJ182V	R:FXD CARBON	1.8K OHM 5% 1/4W	29866	807322180
R 83	ERD25TJ152V	R:FXD CARBON	1.5K OHM 5% 1/4W	29866	807322150
R 84	ERD25TJ102V	R:FXD CARBON	1K OHM 5% 1/4W	29866	807322100
R 85	ERD25TJ561V	R:FXD CARBON	560 OHM 5% 1/4W	29866	807321560
R 86	ERD25TJ101V	R:FXD CARBON	100 OHM 5% 1/4W	29866	807321100
R 87	ERD25TJ332V	R:FXD CARBON	3.3K OHM 5% 1/4W	29866	807322330
R 88	ERO25CKF2150	R:FXD MET FLM	215 OHM 1% 1/4W	29866	806620215
R 89	ERO25CKF2150	R:FXD MET FLM	215 OHM 1% 1/4W	29866	806620215
R 90	ERO25CKF5620	R:FXD MET FLM	562 OHM 1% 1/4W	29866	806620562
R 91	ET6X102	R:VAR CERMET	1K OHM 20% 1/2W	12001	819998176
R 92	ERO25CKF1821	R:FXD MET FLM	1.82K OHM 1% 1/4W	29866	806621182
R 93	ERD25TJ223V	R:FXD CARBON	22K OHM 5% 1/4W	29866	807323220
R 94	ERD25TJ473V	R:FXD CARBON	47K OHM 5% 1/4W	29866	807323470
R 95	ERD25TJ123V	R:FXD CARBON	12K OHM 5% 1/4W	29866	807323120
R 96	ERD25TJ153V	R:FXD CARBON	15K OHM 5% 1/4W	29866	807323150
R 97	ERD25TJ104V	R:FXD CARBON	100K OHM 5% 1/4W	29866	807324100
R 98	ERD25TJ682V	R:FXD CARBON	6.8K OHM 5% 1/4W	29866	807322680
R 99	ET6X502	R:VAR CERMET	5K OHM 20% 1/2W	12001	819998178
R 100	ERD25TJ682V	R:FXD CARBON	6.8K OHM 5% 1/4W	29866	807322680
R 101	ERD25TJ101V	R:FXD CARBON	100 OHM 5% 1/4W	29866	807321100
R 102	ERD25TJ682V	R:FXD CARBON	6.8K OHM 5% 1/4W	29866	807322680
R 103	ERD25TJ682V	R:FXD CARBON	6.8K OHM 5% 1/4W	29866	807322680
R 104	ERD25TJ222V	R:FXD CARBON	2.2K OHM 5% 1/4W	29866	807322220
R 105	ERD50TJ101	R:FXD CARBON	100 OHM 5% 1/2W	29866	807421100
R 110	ERG2ANJ222	R:FXD MET OXD	2.2K OHM 5% 2W	29861	808832220
R 111	ERD25TJ103V	R:FXD CARBON	10K OHM 5% 1/4W	29866	807323100
R 112	ERD25TJ102V	R:FXD CARBON	1K OHM 5% 1/4W	29866	807322100
R 113	ERD50TJ824	R:FXD CARBON	820K OHM 5% 1/2W	29866	807424820
R 114	ERD50TJ754	R:FXD CARBON	750K OHM 5% 1/2W	29866	807424750
R 121	ERD25TJ103V	R:FXD CARBON	10K OHM 5% 1/4W	29866	807323100
R 122	ERD25TJ103V	R:FXD CARBON	10K OHM 5% 1/4W	29866	807323100
R 130	ERD50TJ154	R:FXD CARBON	150K OHM 5% 1/2W	29866	807424150
R 131	EVHLVAC40B26	R:VAR CARBON	2M OHM 20% 1/5W	29871	810521030
R 141	ERD25TJ331V	R:FXD CARBON	330 OHM 5% 1/4W	29866	807321330
R 142	ERG2ANJ470	R:FXD MET OXD	47 OHM 5% 2W	29861	808870470
R 143	ERG2ANJ470	R:FXD MET OXD	47 OHM 5% 2W	29861	808870470
R 144	ERF5AJ271	R:FXD WW CEMENT	270 OHM 5% 5W	29861	806111270
RT 1	ERTD3ZHL402S	THERMISTOR	4K OHM 15%	29890	809900320
T 1	ETH14Y8AY	2050A TRANSFOMER	MATCHING	29910	851001100
T 2	ETH14Y8AY	2050A TRANSFOMER	MATCHING	29910	851001100
T 3	ETF32L25D	2050A TRANSFOMER	FLYBACK	29910	850800410
U 1	SN74S04N	IC:TTL S	HEX INVERTER	14558	640740410
U 2	TL082CP	IC:OP AMP	BI-FET DUAL	14558	639990190
U 3	UPC1431ZH	IC:V RGLTR	+12V 1A	12167	621431220

KEY BOARD , DWG NO 4G204327

REF	NO	PART NO	DESCRIPTION		MFR/DBR	CODE-NO
C	1	ECEB1CS100	C:FXD AL ELECT	10UF +30%-10% 16V	29680	820088310
C	2	ECEB1CS100	C:FXD AL ELECT	10UF +30%-10% 16V	29680	820088310
DS	1	LN48YP	LED	AMBER	29256	776000900
DS	2	LN48YP	LED	AMBER	29256	776000900
DS	3	LN28WP	LED	RED	29269	776001000
E	1	2G401241-1	P3620A PC BOARD	KEY BOARD	ORGNL	972124110
Q	1	2SA564A-RS	TSTR:SI PNP	PC:250MW FT:80MHZ	29256	760564110
R	1	ERD25TJ681V	R:FXD CARBON	680 OHM 5% 1/4W	29866	807321680
R	2	ERD25TJ332V	R:FXD CARBON	3.3K OHM 5% 1/4W	29866	807322330
R	3	ERD25TJ101V	R:FXD CARBON	100 OHM 5% 1/4W	29866	807321100
R	4	ERD25TJ221V	R:FXD CARBON	220 OHM 5% 1/4W	29866	807321220
R	5	ERD25TJ473V	R:FXD CARBON	47K OHM 5% 1/4W	29866	807323470
R	6	ERD25TJ221V	R:FXD CARBON	220 OHM 5% 1/4W	29866	807321220
R	7	ERD25TJ473V	R:FXD CARBON	47K OHM 5% 1/4W	29866	807323470
S	1	82S15	PUSHB SW	KHJ TYPE	11154	873004470
S	2	82S15	PUSHB SW	KHJ TYPE	11154	873004470
S	3	82S15	PUSHB SW	KHJ TYPE	11154	873004470
S	4	82S15	PUSHB SW	KHJ TYPE	11154	873004470
S	5	82S15	PUSHB SW	KHJ TYPE	11154	873004470
S	6	82S15	PUSHB SW	KHJ TYPE	11154	873004470
S	7	82S15	PUSHB SW	KHJ TYPE	11154	873004470
S	8	82S15	PUSHB SW	KHJ TYPE	11154	873004470
S	9	82S15	PUSHB SW	KHJ TYPE	11154	873004470
S	10	82S15	PUSHB SW	KHJ TYPE	11154	873004470
S	11	82S15	PUSHB SW	KHJ TYPE	11154	873004470
S	12	82S15	PUSHB SW	KHJ TYPE	11154	873004470
S	13	82S15	PUSHB SW	KHJ TYPE	11154	873004470
S	14	82S15	PUSHB SW	KHJ TYPE	11154	873004470
S	15	82S15	PUSHB SW	KHJ TYPE	11154	873004470
S	16	82S15	PUSHB SW	KHJ TYPE	11154	873004470
S	17	82S15	PUSHB SW	KHJ TYPE	11154	873004470
S	18	82S15	PUSHB SW	KHJ TYPE	11154	873004470
S	19	82S15	PUSHB SW	KHJ TYPE	11154	873004470
S	20	82S15	PUSHB SW	KHJ TYPE	11154	873004470
S	21	82S15	PUSHB SW	KHJ TYPE	11154	873004470
S	22	82S15	PUSHB SW	KHJ TYPE	11154	873004470
S	23	82S15	PUSHB SW	KHJ TYPE	11154	873004470
S	24	82S15	PUSHB SW	KHJ TYPE	11154	873004470
S	25	82S15	PUSHB SW	KHJ TYPE	11154	873004470
S	26	82S15	PUSHB SW	KHJ TYPE	11154	873004470
S	27	82S15	PUSHB SW	KHJ TYPE	11154	873004470
S	28	82S15	PUSHB SW	KHJ TYPE	11154	873004470
S	29	82S15	PUSHB SW	KHJ TYPE	11154	873004470
S	30	82S15	PUSHB SW	KHJ TYPE	11154	873004470
S	31	82S15	PUSHB SW	KHJ TYPE	11154	873004470
S	32	82S15	PUSHB SW	KHJ TYPE	11154	873004470
S	33	82S14	PUSHB SW	KHJ TYPE AMBER	11154	873004460
S	34	82S15	PUSHB SW	KHJ TYPE	11154	873004470
S	35	82S14	PUSHB SW	KHJ TYPE AMBER	11154	873004460
S	36	82S14	PUSHB SW	KHJ TYPE AMBER	11154	873004460
U	1	SN74123N	IC:TTL	DUAL MONO MULTIVIBRATOR	14558	647412300
W	1	3G470104	P3620A CABLE ASSY	KEY BOARD CABLE 26FLAT	ORGNL	918201080

POWER DWG NO 46204329

REF	NO	PART NO	DESCRIPTION		MFR/DBR	CODE-NO
C	1	ECKDHS222MD	C:FXD CER HI-K	2200PF 20% 400V	29897	823506130
C	2	ECKDHS222MD	C:FXD CER HI-K	2200PF 20% 400V	29897	823506130
C	3	ECKDHS222MD	C:FXD CER HI-K	2200PF 20% 400V	29897	823506130
C	4	ECKDHS222MD	C:FXD CER HI-K	2200PF 20% 400V	29897	823506130
C	5	ECET2DR471SW	C:FXD AL ELECT	470UF +30%-10% 200V	29880	820236300
C	6	ECET2DR471SW	C:FXD AL ELECT	470UF +30%-10% 200V	29880	820236300
C	7	ECEA2ES100	C:FXD AL ELECT	10UF +30%-10% 250V	29880	820019160
C	8	ECEA2ES100	C:FXD AL ELECT	10UF +30%-10% 250V	29880	820019160
C	9	ECQM1H223KZ	C:FXD FLM	0.022UF 10% 50V	26550	825132240
C	10	ECQM1H333KZ	C:FXD FLM	0.033UF 10% 50V	26550	825133340
C	21	ECKW2H102MD	C:FXD CER HI-K	1000PF +-20% 500V	29897	823552100
C	22	ECKW1H223ZF5	C:FXD CER HI-K	22000PF +80-20% 50V	29897	822000134
C	23	ECKW1H223ZF5	C:FXD CER HI-K	22000PF +80-20% 50V	29897	822000134
C	24	ECEA25Z100	C:FXD AL ELECT	100UF 20% 25V	29880	820074310
C	25	ECQM1H223KZ	C:FXD FLM	0.022UF 10% 50V	26550	825132240
C	26	ECQM1H223KZ	C:FXD FLM	0.022UF 10% 50V	26550	825132240
C	27	ECEA450V4R7	C:FXD AL ELECT	4.7UF +75%-10% 450V	29880	820079010
C	31	ECEA25Z100	C:FXD AL ELECT	100UF 20% 25V	29880	820074310
C	32	ECQM1H102KZ	C:FXD FLM	1000PF 10% 50V	26550	825121040
C	33	ECQM1H683KZ	C:FXD FLM	0.068UF 10% 50V	26550	825136840
C	34	ECEA1CS100	C:FXD AL ELECT	10UF +30%-10% 16V	29880	820018310
C	35	ECEA25Z4R7	C:FXD AL ELECT	4.7UF 20% 25V	29880	820074320
C	36	ECKW1H473ZF5	C:FXD CER HI-K	47000PF +80-20% 50V	29897	822000135
C	37	ECKW1H332MD5	C:FXD CER HI-K	3300PF +-20% 50V	29897	822000122
C	38	ECKW1H332MD5	C:FXD CER HI-K	3300PF +-20% 50V	29897	822000122
C	39	ECKW1H332MD5	C:FXD CER HI-K	3300PF +-20% 50V	29897	822000122
C	40	ECKW1H223ZF5	C:FXD CER HI-K	22000PF +80-20% 50V	29897	822000134
C	51	ECKW1H473ZF5	C:FXD CER HI-K	47000PF +80-20% 50V	29897	822000135
C	52	ECEA50Z330	C:FXD AL ELECT	330UF 20% 50V	29880	820380070
C	53	ECKW1H473ZF5	C:FXD CER HI-K	47000PF +80-20% 50V	29897	822000135
C	54	ECEA25Z330	C:FXD AL ELECT	330UF 20% 25V	29880	820074330
C	55	ECKW1H473ZF5	C:FXD CER HI-K	47000PF +80-20% 50V	29897	822000135
C	56	ECEA50Z100	C:FXD AL ELECT	100UF 20% 50V	29880	820380080
C	57	ECKW1H473ZF5	C:FXD CER HI-K	47000PF +80-20% 50V	29897	822000135
C	58	ECEA16Z330	C:FXD AL ELECT	330UF 20% 16V	29880	820073370
C	59	ECEA16Z222	C:FXD AL ELECT	2200UF 20% 16V	29880	820073390
C	61	ECEA1HS010	C:FXD AL ELECT	1UF +30%-10% 50V	29880	820018810
C	62	ECEA16Z33	C:FXD AL ELECT	33UF 20% 16V	29880	820073360
CR	1	S5VB60	DIODE:PWR RECT	6A 600V	12353	772001440
CR	2	V08J	DIODE:SI	1.1A 800V	14458	772000880
CR	3	V08J	DIODE:SI	1.1A 800V	14458	772000880
CR	21	S5KC20	DIODE:PWR RECT	5A 200V FAST RECOVERY	12353	772001420
CR	51	S5KC20	DIODE:PWR RECT	5A 200V FAST RECOVERY	12353	772001420
CR	52	S5KC20R	DIODE:PWR RECT	5A 200V FAST RECOVERY	12353	772001430
CR	53	S5KC20	DIODE:PWR RECT	5A 200V FAST RECOVERY	12353	772001420
CR	54	S5KC20R	DIODE:PWR RECT	5A 200V FAST RECOVERY	12353	772001430
CR	55	S30SC4F	DIODE:SCHOTTKY	30A 300V	12353	772001450
CR	56	MA150TA	DIODE:SI	100MA 35V	29256	773150010
E	1	2G401243-1	P3620A PC BOARD	POWER	ORGNL	972124310
E	2	170001-2	CONNECTOR	FAST-ON 187 TAB	14441	911102050
E	3	170001-2	CONNECTOR	FAST-ON 187 TAB	14441	911102050
E	4	170001-2	CONNECTOR	FAST-ON 187 TAB	14441	911102050
E	5	170001-2	CONNECTOR	FAST-ON 187 TAB	14441	911102050
E	6	170001-2	CONNECTOR	FAST-ON 187 TAB	14441	911102050
E	7	170001-2	CONNECTOR	FAST-ON 187 TAB	14441	911102050
E	8	170001-2	CONNECTOR	FAST-ON 187 TAB	14441	911102050
E	9	170001-2	CONNECTOR	FAST-ON 187 TAB	14441	911102050
E	10	170001-2	CONNECTOR	FAST-ON 187 TAB	14441	911102050
E	11	170001-2	CONNECTOR	FAST-ON 187 TAB	14441	911102050
E	12	170001-2	CONNECTOR	FAST-ON 187 TAB	14441	911102050
E	13	170001-2	CONNECTOR	FAST-ON 187 TAB	14441	911102050

POWER DWG NO 46204329

REF NO	PART NO	DESCRIPTION		MFR/DBR	CODE-NO
FL 1	FKOB160MH13	LINE FILTER	2.5A 125V	10001	856400270
J 1	350211-1	CONNECTOR	PIN HEADER 4P	14441	911101950
J 2	350209-1	CONNECTOR:PIN	METE-N-LOK CONTACT	14441	911102290
J 3	OM93-12	TERMINAL	TERMINAL 12P	10001	895312270
J 4	CM3	CONNECTOR	PWR JACK 3P	15360	911001791
L 1	SFT850S	COIL:CHOKE	72UH	13977	858800020
L 31	SFT850S	COIL:CHOKE	72UH	13977	858800020
L 51	SFT1250	COIL:CHOKE	100UH	13977	858800010
L 52	SFT1250	COIL:CHOKE	100UH	13977	858800010
L 53	SFT1250	COIL:CHOKE	100UH	13977	858800010
L 54	SFT1250	COIL:CHOKE	100UH	13977	858800010
L 55	SFHP10A	COIL:CHOKE	60UH 10A	13977	858800030
Q 1	2SC2333	TSTR:SI NPN	PC:15W	12167	764233300
Q 2	2SC2333	TSTR:SI NPN	PC:15W	12167	764233300
Q 21	2SA699A-QR	TSTR:SI PNP	PC:10W FT:150MHZ	29256	760699130
Q 22	2SC1226A-QR	TSTR:SI NPN	PC:10W FT:150MHZ	29256	764122640
Q 23	2SA699A-QR	TSTR:SI PNP	PC:10W FT:150MHZ	29256	760699130
Q 24	2SC1226A-QR	TSTR:SI NPN	PC:10W FT:150MHZ	29256	764122640
Q 25	2SC2834	TSTR:SI NPN	PC:100W VCB0800V	10001	764283400
Q 26	2SC2834	TSTR:SI NPN	PC:100W VCB0800V	10001	764283400
R 1	ERF2AJR10	R:FXD WW CEMENT	0.1 OHM 5% 2W	29861	806347100
R 2	ERD50TJ184	R:FXD CARBON	180K OHM 5% 1/2W	29866	807424180
R 3	ERD50TJ184	R:FXD CARBON	180K OHM 5% 1/2W	29866	807424180
R 4	ERD50TJ184	R:FXD CARBON	180K OHM 5% 1/2W	29866	807424180
R 5	ERD50TJ184	R:FXD CARBON	180K OHM 5% 1/2W	29866	807424180
R 6	ERD50TJ274	R:FXD CARBON	270K OHM 5% 1/2W	29866	807424270
R 7	ERD25TJ821V	R:FXD CARBON	820 OHM 5% 1/4W	29866	807321820
R 8	ERD25TJ182V	R:FXD CARBON	1.8K OHM 5% 1/4W	29866	807322180
R 9	ERD25TJ102V	R:FXD CARBON	1K OHM 5% 1/4W	29866	807322100
R 10	ERD25TJ182V	R:FXD CARBON	1.8K OHM 5% 1/4W	29866	807322180
R 21	ERD25TJ101V	R:FXD CARBON	100 OHM 5% 1/4W	29866	807321100
R 22	ERD50TJ681	R:FXD CARBON	680 OHM 5% 1/2W	29866	807421680
R 23	ERD25TJ392V	R:FXD CARBON	3.9K OHM 5% 1/4W	29866	807322390
R 24	ERD25TJ332V	R:FXD CARBON	3.3K OHM 5% 1/4W	29866	807322330
R 25	ERG2ANJ820	R:FXD MET OXD	82 OHM 5% 2W	29861	808830820
R 26	ERD25TJ101V	R:FXD CARBON	100 OHM 5% 1/4W	29866	807321100
R 27	ERD50TJ681	R:FXD CARBON	680 OHM 5% 1/2W	29866	807421680
R 28	ERD25TJ392V	R:FXD CARBON	3.9K OHM 5% 1/4W	29866	807322390
R 29	ERD25TJ332V	R:FXD CARBON	3.3K OHM 5% 1/4W	29866	807322330
R 30	ERG2ANJ820	R:FXD MET OXD	82 OHM 5% 2W	29861	808830820
R 31	ERO25CKF1502	R:FXD MET FLM	15K OHM 1% 1/4W	29866	806622150
R 32	ERO25CKF4751	R:FXD MET FLM	4.75K OHM 1% 1/4W	29866	806621475
R 33	ERD25TJ392V	R:FXD CARBON	3.9K OHM 5% 1/4W	29866	807322390
R 34	ERD25TJ272V	R:FXD CARBON	2.7K OHM 5% 1/4W	29866	807322270
R 35	ERO25CKF4751	R:FXD MET FLM	4.75K OHM 1% 1/4W	29866	806621475
R 36	ERO25CKF4751	R:FXD MET FLM	4.75K OHM 1% 1/4W	29866	806621475
R 37	ERO25CKF2212	R:FXD MET FLM	22.1K OHM 1% 1/4W	29866	806622221
R 38	ERD25TJ101V	R:FXD CARBON	100 OHM 5% 1/4W	29866	807321100
R 39	ERD25TJ104V	R:FXD CARBON	100K OHM 5% 1/4W	29866	807324100
R 40	ERF2AJR10	R:FXD WW CEMENT	0.1 OHM 5% 2W	29861	806347100
R 41	ERO25CKF5491	R:FXD MET FLM	5.49K OHM 1% 1/4W	29866	806621549
R 42	RJ6X502	R:VAR CERMET	5K OHM 20% 1/2W	12001	819990760
R 51	ERO25CKF1501	R:FXD MET FLM	1.50K OHM 1% 1/4W	29866	806621150
R 52	RJ6X102	R:VAR CERMET	1K OHM 20% 1/2W	12001	819990200
R 53	ERO25CKF5620	R:FXD MET FLM	562 OHM 1% 1/4W	29866	806620562
R 54	ERD25TJ122V	R:FXD CARBON	1.2K OHM 5% 1/4W	29866	807322120
R 55	ERO25CKF2211	R:FXD MET FLM	2.21K OHM 1% 1/4W	29866	806621221
R 56	ERO25CKF5620	R:FXD MET FLM	562 OHM 1% 1/4W	29866	806620562
R 57	ERD25TJ182V	R:FXD CARBON	1.8K OHM 5% 1/4W	29866	807322180

POWER DWG NO 4G204329

REF NO	PART NO	DESCRIPTION		MFR/DBR	CODE-NO
RT 1	ERZC14DK471	ZNR	VC=470V	29890	809940090
RT 2	PS2002	PHOTO COUPLER		12167	769001400
S 1	ESD39511A	SLIDE SW	5A 125VAC	10001	872001260
T *1	BPQ2016	CORE		13977	854902350
T *1	FPQ2016A	CORE		13977	854902370
T *1	H7C1PQ2016	CORE		13977	854902330
T *2	BPQ4040	CORE		13977	854902340
T *2	FPQ4040A	CORE		13977	854902360
T *2	H7C1PQ4040	CORE		13977	854902320
T 1	3G430435	P3660A TRANSFORMER	OSC(B)	ORGNL	850100410
T 2	3G430481	P3620A TRANSFORMER	OSC	ORGNL	850004140
U 1	UPC1042C	IC	SWITCHING REG CONTROL	12167	620104210
U 51	UPC157C	IC:OP AMP		12167	620015710
VR 1	XZ060	DIODE:ZENER	6.0V 500MW	12385	775001540
XF 1	FEK031.1663	FUSE HOLDER CAP	5X20MM FUSE	14385	891600430
XF 1	FEU031.1653	FUSE HOLDER	SEV,VDE,SEMKO,UL AND CSA	14385	891600420

OP MOTHER DWG NO 4G204331

REF NO	PART NO	DESCRIPTION		MFR/DBR	CODE-NO
E 1	3G401256	P3620A PC BOARD	MOTHER	ORGNL	973125600
E 2	50-6010	PC GUIDE	L=112.8MM	17194	911101800
E 3	50-6010	PC GUIDE	L=112.8MM	17194	911101800
E 4	50-6010	PC GUIDE	L=112.8MM	17194	911101800
E 5	50-6010	PC GUIDE	L=112.8MM	17194	911101800
E 6	50-6010	PC GUIDE	L=112.8MM	17194	911101800
E 7	50-6010	PC GUIDE	L=112.8MM	17194	911101800
J 1	3433-2002LCS	CONNECTOR	50P	12017	911102580
J 2	2522850169M	CONNECTOR:EDGE	28P DOUBLE	16366	911001650
J 3	2522850169M	CONNECTOR:EDGE	28P DOUBLE	16366	911001650
J 4	2522850169M	CONNECTOR:EDGE	28P DOUBLE	16366	911001650
J 5	EMCS1050	CONNECTOR	10P L=500MM	29850	911002600
J 6	3433-2002LCS	CONNECTOR	50P	12017	911102580
P 1	EMCB1020A56V	CONNECTOR	10P L=200MM	29850	911002700
W 1	3G470085	P3620A CABLE ASSY	OPTION CABLE 50P FLAT	ORGNL	918201100
W 2	3G470085	P3620A CABLE ASSY	OPTION CABLE 50P FLAT	ORGNL	918201100

MECHA DWG NO 4G302620

REF NO	QTY	PART NO	DESCRIPTION	MFR/DBR	CODE-NO
	1	A72G-74M001	FASTNER:CRT BAND	16355	264428160
	1	R76W-60743C	BAND:POWER CORD	13197	270030890
	1	2G580685-0FE	P3620A PLATE,REAR	ORGNL	258206850
	1	2G590579-0CB	P3620A SUBPANEL:CRT	ORGNL	259205790
	1	2G590580-0FB	P3620A CHASSIS:MEDIAL	ORGNL	259205800
	1	2G611515-0FB	P3620A MTG,FRONT:PCB	ORGNL	261215150
	1	2G611516-0FB	P3620A MTG,REAR:PCB	ORGNL	261215160
	1	2G611517-0WB	P3620A CASE:POWER	ORGNL	261215170
	1	2G611518-0EB	P3620A COVER:POWER	ORGNL	261215180
	1	2G611519-0WB	P3620A CASE:CARD	ORGNL	261215190
	1	2G630576-0CC	P3620A PANEL	ORGNL	263205760
	1	2G760515-0A	P3620A BEZEL	ORGNL	276205150
	1	3G530513-0K	P3620A FILTER	ORGNL	253305130
	1	3G580720-0CF	P3620A CASE:FAN	ORGNL	258307200
7	1	3G614018-0B8	P3620A COVER:CARD	ORGNL	261340180
	1	3G660527-0GF	P3620A TRIM,RH	ORGNL	266305270
	1	3G660528-0GF	P3620A TRIM,LH	ORGNL	266305280
	1	3G670569-0DB	P3620A HEAT SINK-1	ORGNL	267305690
	1	3G700514-0J	P3620A HOLDER:PCB	ORGNL	270305140
	1	3G700515-0G	P3620A SHEET:INSULATION	ORGNL	270305150
	2	3G710401-0N	BAG:PACKING	ORGNL	271304010
	1	3G760040-0C	PUSHBUTTON,7X7 GREEN	ORGNL	276300400
	4	3G760519-0G	P5220A FOOT,REAR	ORGNL	276305190
	3	4G540024-0B	P385B SPRING	ORGNL	254400240
	2	4G540157-0P	P3660A CUSHION	ORGNL	254401570
	3	4G580600-0AF	P3620A BLANK PLATE:CARD	ORGNL	258406000
	2	4G615470-1EB	P3660A CLAMP:PCB	ORGNL	261454701
	1	4G617032-0WB	P3620A HOLDER:PWR SW	ORGNL	261470320
	5	4G617033-0BS	P3620A HOLDER:CONN	ORGNL	261470330
	1	4G617034-0BB	P3620A BRACKET TOP:PCB	ORGNL	261470340
	1	4G617035-0BS	P3620A BRACKET,RH:PCB	ORGNL	261470350
	4	4G617036-0PB	P3620A CLAMP:CONN	ORGNL	261470360
	1	4G617037-0CB	P3620A CLAMP:TSTR	ORGNL	261470370
	1	4G617038-0BB	P3620A HEAT SINK-2	ORGNL	261470380
	1	4G617039-0PB	P3620A NUT:PLATE	ORGNL	261470390
	1	4G633433-0W	LABEL:ID NO	ORGNL	
	1	4G634055-0W	P3620A LABEL:IDENT	ORGNL	263440550
	4	4G644132-1AB	SPACER 3X7.5	ORGNL	264441321
	6	4G644144-1AB	SPACER 3X10	ORGNL	264441441
	2	4G644153-1BB	STUD 3X10	ORGNL	264441531
	1	4G650002-0M	2300 SHIELD,CRT	ORGNL	265400020
	2	4G650513-0NB	P3620A NET:FAN	ORGNL	265405130
	1	4G670025-0GB	P3660A HEAT SINK:POWER	ORGNL	267400250
	1	4G702632-0G	P3620A PLATE,L:INS	ORGNL	270426320
	1	4G702633-0G	P3620A PLATE,S:INS	ORGNL	270426330
	1	4G702634-0G	P3620A PROTECTOR:CABLE	ORGNL	270426340
	4	4G712001-1N	BAG:ACCESSORY	ORGNL	271420011
	1	4G712052-0N	2300 COVER:PACKING	ORGNL	271420520
	4	4G720560-0JB	P3620A INSERT:BEZEL	ORGNL	
	1	4G760089-0D	BEZEL:PUSHBUTTON,7X7-1.5	ORGNL	276400890
	3	4G760543-0C	KEYTOP,RECT W/LED	ORGNL	276405430
	13	4G760544-0C	KEYTOP,RECT	ORGNL	276405440
	1	4G760546-0C	KEYTOP,SQ	ORGNL	276405460
	1	4G760578-0CA	P3620A KEYTOP,0	ORGNL	276405780
	1	4G760579-0CA	P3620A KEYTOP,1	ORGNL	276405790
	1	4G760580-0CA	P3620A KEYTOP,2	ORGNL	276405800
	1	4G760581-0CA	P3620A KEYTOP,3	ORGNL	276405810
	1	4G760582-0CA	P3630A KEYTOP,4	ORGNL	276405820
	1	4G760583-0CA	P3620A KEYTOP,5	ORGNL	276405830
	1	4G760584-0CA	P3620A KEYTOP,6	ORGNL	276405840

MECHA DWG NO 4G302620

REF NO	QTY	PART NO	DESCRIPTION	MFR/DBR	CODE-NO
	1	4G760585-0CA	P3620A KEYTOP,7	ORGNL	276405850
	1	4G760586-0CA	P3620A KEYTOP,8	ORGNL	276405860
	1	4G760587-0CA	P3620A KEYTOP,9	ORGNL	276405870
	1	4G760588-0CA	P3620A KEYTOP,A	ORGNL	276405880
	1	4G760589-0CA	P3620A KEYTOP,B	ORGNL	276405890
	1	4G760590-0CA	P3620A KEYTOP,C	ORGNL	276405900
	1	4G760591-0CA	P3620A KEYTOP,D	ORGNL	276405910
	1	4G760592-0CA	P3620A KEYTOP,E	ORGNL	276405920
	1	4G760593-0CA	P3620A KEYTOP,F	ORGNL	276405930
	1	4G760594-0CA	P3620A KEYTOP,OH	ORGNL	276405940
	1	4G760595-0CA	P3620A KEYTOP,1H	ORGNL	276405950
	1	4G760596-0CA	P3620A KEYTOP,X	ORGNL	276405960
	1	4G780524-0N	P5220A GUARD:CRT	ORGNL	278405240

CABINET DWG NO 4G302619

REF NO	QTY	PART NO	DESCRIPTION	MFR/DBR	CODE-NO
	1	2G580172-0C	P3660A COVER,LOWER	ORGNL	258201720
	1	3G580159-0CF	P3660A COVER,UPPER	ORGNL	258301590
	2	3G660046-0BF	P3660A FRAME,SIDE	ORGNL	266300460
	4	3G670568-0BF	P3620A TRIM,FRONT	ORGNL	267305680
	1	4G550009-0E	HANDLE ASSEY,MIDDLE	ORGNL	255400090
	2	4G550020-0FF	P5250A HOLDER:HANDLE-M	ORGNL	255400200
	1	4G550032-0NB	P5503A STAND	ORGNL	255400320
	1	4G580024-0A	P3660A TRIM-1	ORGNL	258400240
	2	4G580025-0A	P3660A TRIM-2	ORGNL	258400250
	1	4G580026-0A	P3660A TRIM-3	ORGNL	258400260
	2	4G580027-0A	P3660A TRIM-4	ORGNL	258400270
	2	4G760127-2G	FOOT,RECTANGULAR-RH	ORGNL	276401272
	2	4G760128-2G	FOOT,RECTANGULAR-LH	ORGNL	276401282
	8	4G760131-1G	RUBBER:FOOT,RECTANGULAR	ORGNL	276401311
	4	4G760143-0G	P3660A FOOT:SIDE	ORGNL	276401430

Q059A20 PROBE DWG NO 4G204332

REF NO	PART NO	DESCRIPTION		MFR/DBR	CODE-NO
C 1	ECCF1H150K	C:FXD CER TC	15PF +-10% 50V SL	29897	822000411
C 11	ECCF1H150K	C:FXD CER TC	15PF +-10% 50V SL	29897	822000411
C 21	ECCF1H150K	C:FXD CER TC	15PF +-10% 50V SL	29897	822000411
C 31	ECCF1H150K	C:FXD CER TC	15PF +-10% 50V SL	29897	822000411
C 41	ECCF1H150K	C:FXD CER TC	15PF +-10% 50V SL	29897	822000411
C 51	ECCF1H150K	C:FXD CER TC	15PF +-10% 50V SL	29897	822000411
C 61	ECCF1H150K	C:FXD CER TC	15PF +-10% 50V SL	29897	822000411
C 71	ECCF1H150K	C:FXD CER TC	15PF +-10% 50V SL	29897	822000411
C 81	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C 82	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C 83	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C 85	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C 86	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C 91	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C 92	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C 93	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
C 94	MD015E104Z	C:FXD CER MULTILAYER	0.1UF +80-20% 50V	12956	825400270
CR 1	MA161TAP	DIODE:SI	100MA 50V	29256	773161000
CR 2	MA161TAP	DIODE:SI	100MA 50V	29256	773161000
CR 11	MA161TAP	DIODE:SI	100MA 50V	29256	773161000
CR 12	MA161TAP	DIODE:SI	100MA 50V	29256	773161000
CR 21	MA161TAP	DIODE:SI	100MA 50V	29256	773161000
CR 22	MA161TAP	DIODE:SI	100MA 50V	29256	773161000
CR 31	MA161TAP	DIODE:SI	100MA 50V	29256	773161000
CR 32	MA161TAP	DIODE:SI	100MA 50V	29256	773161000
CR 41	MA161TAP	DIODE:SI	100MA 50V	29256	773161000
CR 42	MA161TAP	DIODE:SI	100MA 50V	29256	773161000
CR 51	MA161TAP	DIODE:SI	100MA 50V	29256	773161000
CR 52	MA161TAP	DIODE:SI	100MA 50V	29256	773161000
CR 61	MA161TAP	DIODE:SI	100MA 50V	29256	773161000
CR 62	MA161TAP	DIODE:SI	100MA 50V	29256	773161000
CR 71	MA161TAP	DIODE:SI	100MA 50V	29256	773161000
CR 72	MA161TAP	DIODE:SI	100MA 50V	29256	773161000
E 1	3G401226-1	Q059A20 PC BOARD	PROBE	ORGNL	973122610
E 2	CP027	PROBE TIP:LOGIC		12573	899100520
E 3	CP027	PROBE TIP:LOGIC		12573	899100520
E 4	CP027	PROBE TIP:LOGIC		12573	899100520
E 5	CP027	PROBE TIP:LOGIC		12573	899100520
E 6	CP027	PROBE TIP:LOGIC		12573	899100520
E 7	CP027	PROBE TIP:LOGIC		12573	899100520
E 8	CP027	PROBE TIP:LOGIC		12573	899100520
E 9	CP027	PROBE TIP:LOGIC		12573	899100520
E 10	CP027	PROBE TIP:LOGIC		12573	899100520
FL 1	DSS31055D223	NOISE FILTER	7A 50V 22UF	16551	856400210
FL 2	DSS31055D223	NOISE FILTER	7A 50V 22UF	16551	856400210
J 1	65580-111	CONNECTOR:PIN	11P 3.18PITCH ANGLE TYPE	10001	911003460
J 2	HIF326P254DS	CONNECTOR	26P HEADER	10001	912020840
P 1	3G470103-1	Q059A20 CABLE ASSY	PROBE TIP CABLE	ORGNL	

Q059A20 PROBE , DWG NO 4G204332

REF NO	PART NO	DESCRIPTION		MFR/DBR	CODE-NO
Q 1	UPA68H	TSTR:FET	PT=250MW/UNIT DUAL	12167	769001760
Q 11	UPA68H	TSTR:FET	PT=250MW/UNIT DUAL	12167	769001760
Q 21	UPA68H	TSTR:FET	PT=250MW/UNIT DUAL	12167	769001760
Q 31	UPA68H	TSTR:FET	PT=250MW/UNIT DUAL	12167	769001760
Q 41	UPA68H	TSTR:FET	PT=250MW/UNIT DUAL	12167	769001760
Q 51	UPA68H	TSTR:FET	PT=250MW/UNIT DUAL	12167	769001760
Q 61	UPA68H	TSTR:FET	PT=250MW/UNIT DUAL	12167	769001760
Q 71	UPA68H	TSTR:FET	PT=250MW/UNIT DUAL	12167	769001760
R 1	ERD10TJ221	R:FXD CARBON	220 OHM 5% 1/8W	29866	807141220
R 2	ERD10CKF6652	R:FXD MET FLM	66.5K OHM 1% 1/10W	29866	806652665
R 3	ERD10CKF3322	R:FXD MET FLM	33.2K OHM 1% 1/10W	29866	806652332
R 4	ERD10TJ101	R:FXD CARBON	100 OHM 5% 1/8W	29866	807141100
R 5	ERD10TJ102	R:FXD CARBON	1K OHM 5% 1/8W	29866	807142100
R 6	6M0S23	R:VAR CERMET	2K OHM 20%	13153	819998027
R 7	ERD10TJ471	R:FXD CARBON	470 OHM 5% 1/8W	29866	807141470
R 8	ERD10TJ101	R:FXD CARBON	100 OHM 5% 1/8W	29866	807141100
R 11	ERD10TJ221	R:FXD CARBON	220 OHM 5% 1/8W	29866	807141220
R 12	ERD10CKF6652	R:FXD MET FLM	66.5K OHM 1% 1/10W	29866	806652665
R 13	ERD10CKF3322	R:FXD MET FLM	33.2K OHM 1% 1/10W	29866	806652332
R 14	ERD10TJ101	R:FXD CARBON	100 OHM 5% 1/8W	29866	807141100
R 15	ERD10TJ102	R:FXD CARBON	1K OHM 5% 1/8W	29866	807142100
R 16	6M0S23	R:VAR CERMET	2K OHM 20%	13153	819998027
R 17	ERD10TJ471	R:FXD CARBON	470 OHM 5% 1/8W	29866	807141470
R 18	ERD10TJ101	R:FXD CARBON	100 OHM 5% 1/8W	29866	807141100
R 21	ERD10TJ221	R:FXD CARBON	220 OHM 5% 1/8W	29866	807141220
R 22	ERD10CKF6652	R:FXD MET FLM	66.5K OHM 1% 1/10W	29866	806652665
R 23	ERD10CKF3322	R:FXD MET FLM	33.2K OHM 1% 1/10W	29866	806652332
R 24	ERD10TJ101	R:FXD CARBON	100 OHM 5% 1/8W	29866	807141100
R 25	ERD10TJ102	R:FXD CARBON	1K OHM 5% 1/8W	29866	807142100
R 26	6M0S23	R:VAR CERMET	2K OHM 20%	13153	819998027
R 27	ERD10TJ471	R:FXD CARBON	470 OHM 5% 1/8W	29866	807141470
R 28	ERD10TJ101	R:FXD CARBON	100 OHM 5% 1/8W	29866	807141100
R 31	ERD10TJ221	R:FXD CARBON	220 OHM 5% 1/8W	29866	807141220
R 32	ERD10CKF6652	R:FXD MET FLM	66.5K OHM 1% 1/10W	29866	806652665
R 33	ERD10CKF3322	R:FXD MET FLM	33.2K OHM 1% 1/10W	29866	806652332
R 34	ERD10TJ101	R:FXD CARBON	100 OHM 5% 1/8W	29866	807141100
R 35	ERD10TJ102	R:FXD CARBON	1K OHM 5% 1/8W	29866	807142100
R 36	6M0S23	R:VAR CERMET	2K OHM 20%	13153	819998027
R 37	ERD10TJ471	R:FXD CARBON	470 OHM 5% 1/8W	29866	807141470
R 38	ERD10TJ101	R:FXD CARBON	100 OHM 5% 1/8W	29866	807141100
R 41	ERD10TJ221	R:FXD CARBON	220 OHM 5% 1/8W	29866	807141220
R 42	ERD10CKF6652	R:FXD MET FLM	66.5K OHM 1% 1/10W	29866	806652665
R 43	ERD10CKF3322	R:FXD MET FLM	33.2K OHM 1% 1/10W	29866	806652332
R 44	ERD10TJ101	R:FXD CARBON	100 OHM 5% 1/8W	29866	807141100
R 45	ERD10TJ102	R:FXD CARBON	1K OHM 5% 1/8W	29866	807142100
R 46	6M0S23	R:VAR CERMET	2K OHM 20%	13153	819998027
R 47	ERD10TJ471	R:FXD CARBON	470 OHM 5% 1/8W	29866	807141470
R 48	ERD10TJ101	R:FXD CARBON	100 OHM 5% 1/8W	29866	807141100
R 51	ERD10TJ221	R:FXD CARBON	220 OHM 5% 1/8W	29866	807141220
R 52	ERD10CKF6652	R:FXD MET FLM	66.5K OHM 1% 1/10W	29866	806652665
R 53	ERD10CKF3322	R:FXD MET FLM	33.2K OHM 1% 1/10W	29866	806652332
R 54	ERD10TJ101	R:FXD CARBON	100 OHM 5% 1/8W	29866	807141100
R 55	ERD10TJ102	R:FXD CARBON	1K OHM 5% 1/8W	29866	807142100
R 56	6M0S23	R:VAR CERMET	2K OHM 20%	13153	819998027
R 57	ERD10TJ471	R:FXD CARBON	470 OHM 5% 1/8W	29866	807141470
R 58	ERD10TJ101	R:FXD CARBON	100 OHM 5% 1/8W	29866	807141100

Q059A20 PROBE DWG NO 4G204332

REF	NO	PART NO	DESCRIPTION		MFR/DBR	CODE-NO
R	61	ERD10TJ221	R:FXD CARBON	220 OHM 5% 1/8W	29866	807141220
R	62	ERO10CKF6652	R:FXD MET FLM	66.5K OHM 1% 1/10W	29866	806652665
R	63	ERO10CKF3322	R:FXD MET FLM	33.2K OHM 1% 1/10W	29866	806652332
R	64	ERD10TJ101	R:FXD CARBON	100 OHM 5% 1/8W	29866	807141100
R	65	ERD10TJ102	R:FXD CARBON	1K OHM 5% 1/8W	29866	807142100
R	66	6M0S23	R:VAR CERMET	2K OHM 20%	13153	819998027
R	67	ERD10TJ471	R:FXD CARBON	470 OHM 5% 1/8W	29866	807141470
R	68	ERD10TJ101	R:FXD CARBON	100 OHM 5% 1/8W	29866	807141100
R	71	ERD10TJ221	R:FXD CARBON	220 OHM 5% 1/8W	29866	807141220
R	72	ERO10CKF6652	R:FXD MET FLM	66.5K OHM 1% 1/10W	29866	806652665
R	73	ERO10CKF3322	R:FXD MET FLM	33.2K OHM 1% 1/10W	29866	806652332
R	74	ERD10TJ101	R:FXD CARBON	100 OHM 5% 1/8W	29866	807141100
R	75	ERD10TJ102	R:FXD CARBON	1K OHM 5% 1/8W	29866	807142100
R	76	6M0S23	R:VAR CERMET	2K OHM 20%	13153	819998027
R	77	ERD10TJ471	R:FXD CARBON	470 OHM 5% 1/8W	29866	807141470
R	78	ERD10TJ101	R:FXD CARBON	100 OHM 5% 1/8W	29866	807141100
U	1	NE521N	IC:COMPARATOR	DUAL DIFF.COMP	14485	639990960
U	21	NE521N	IC:COMPARATOR	DUAL DIFF.COMP	14485	639990960
U	41	NE521N	IC:COMPARATOR	DUAL DIFF.COMP	14485	639990960
U	61	NE521N	IC:COMPARATOR	DUAL DIFF.COMP	14485	639990960
U	81	SN74S240N	IC:TTL S	OCTAL BUFFER 3-STATE	14558	647424010
W	1	3G470102	Q059A20 CABLE ASSY	PROBE CABLE 26P TWIST	ORGNL	918201060

Q059A20 MECHA DWG NO 4G302617

REF NO	QTY	PART NO	DESCRIPTION	MFR/DBR	CODE-NO
	2	2G760517-0B	Q059A20 CASE:PROBE	ORGNL	276205170
	1	4G634064-0W	Q059A20 LABEL:IDENT	ORGNL	263440640
	1	4G634065-0W	Q059A20 LABEL:MODEL	ORGNL	263440650
	1	4G634077-0W	Q059A20 LABEL:CONN	ORGNL	263440770
	1	4G702638-0G	Q059A20 BLANK PLATE	ORGNL	270426380
	4	4G702639-0D	Q059A20 SPACER	ORGNL	270426390
	1	4G712028-1N	Q056 BAG:PACKING	ORGNL	271420281

Q059A20E MECHA DWG NO 4G302618

REF NO	QTY	PART NO	DESCRIPTION	MFR/DBR	CODE-NO
	2	2G760517-0B	Q059A20 CASE:PROBE	ORGNL	276205170
	1	4G634066-0W	Q059A20E LABEL:IDENT	ORGNL	263440660
	1	4G634078-0W	Q059A20E LABEL:CONN	ORGNL	263440780
	1	4G702638-0G	Q059A20 BLANK PLATE	ORGNL	270426380
	4	4G702639-0D	Q059A20 SPACER	ORGNL	270426390
	1	4G712028-1N	Q056 BAG:PACKING	ORGNL	271420281

4. CIRCUIT DIAGRAMS

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OVER ALL	A1	1
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DISPLAY RAM	A3	3
INPUT	A4	4
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TRIGGER DETECTOR	A7	7
OPTION 1	A8	8
MOTHER BOARD	A9	9
CRT DISPLAY	A10	10
KEY BOARD	A11	11
POWER	A12	12
OP MOTHER	A13	13
PROBE	A14	14

NOTES

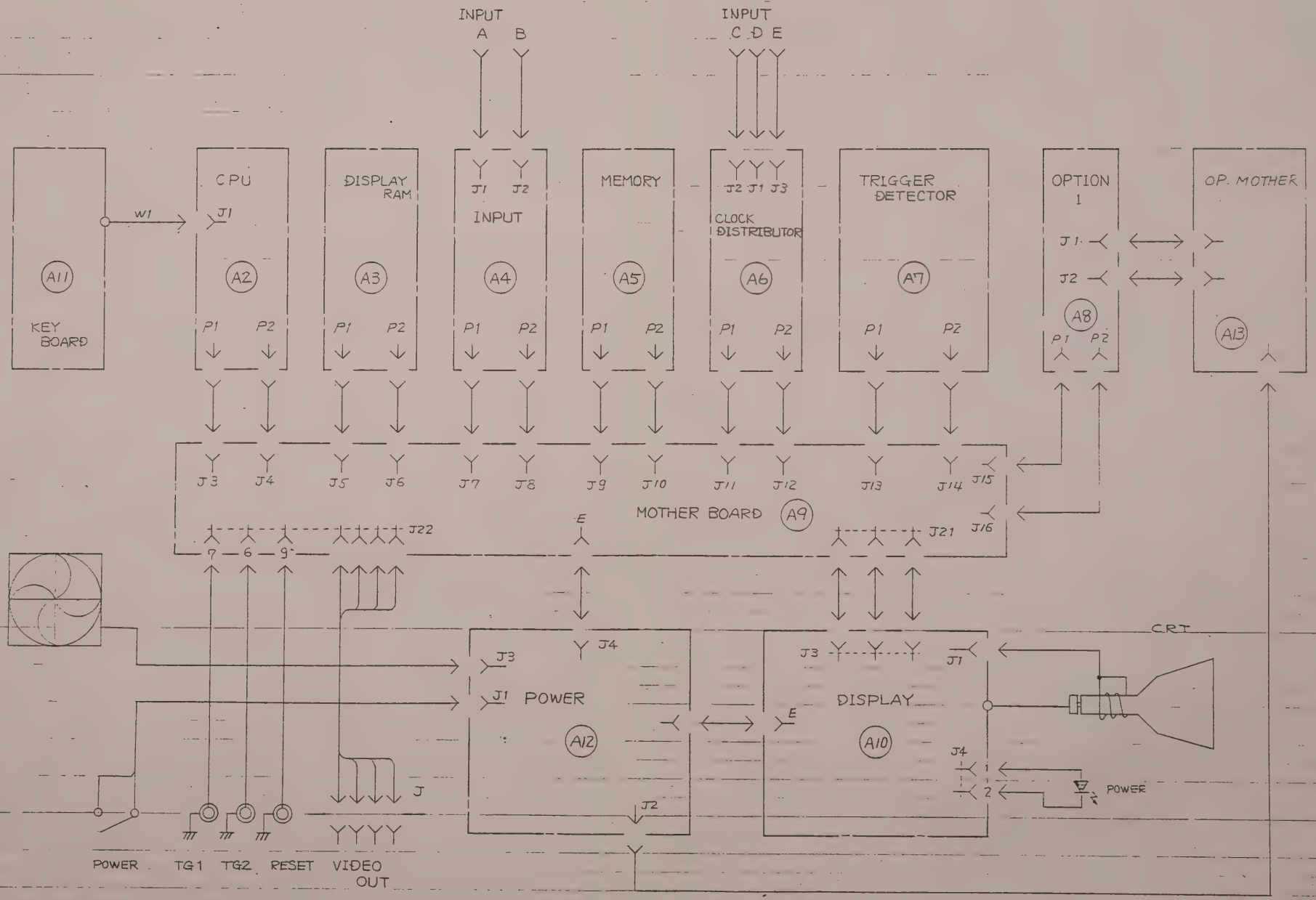
▷ WHEN THE CIRCUIT IS DIVIDED INTO SOME UNITS AND AN IDENTIFYING NUMBER IS ASSIGNED TO EACH UNIT, REFERENCE DESIGNATORS IN EACH CIRCUIT DIAGRAM ARE GIVEN IN ABBREVIATED FORM. PREFIX WITH EACH IDENTIFYING NUMBER FOR COMPLETE DESCRIPTION.
EXAMPLES; A1C1, A6R3.

▷ RESISTANCE VALUES IN OHMS AND CAPACITANCE IN PICOFARADS(FROM 1 TO 9,999) OR MICROFARADS (FROM 0.01 TO 0.99) UNLESS OTHERWISE NOTED.

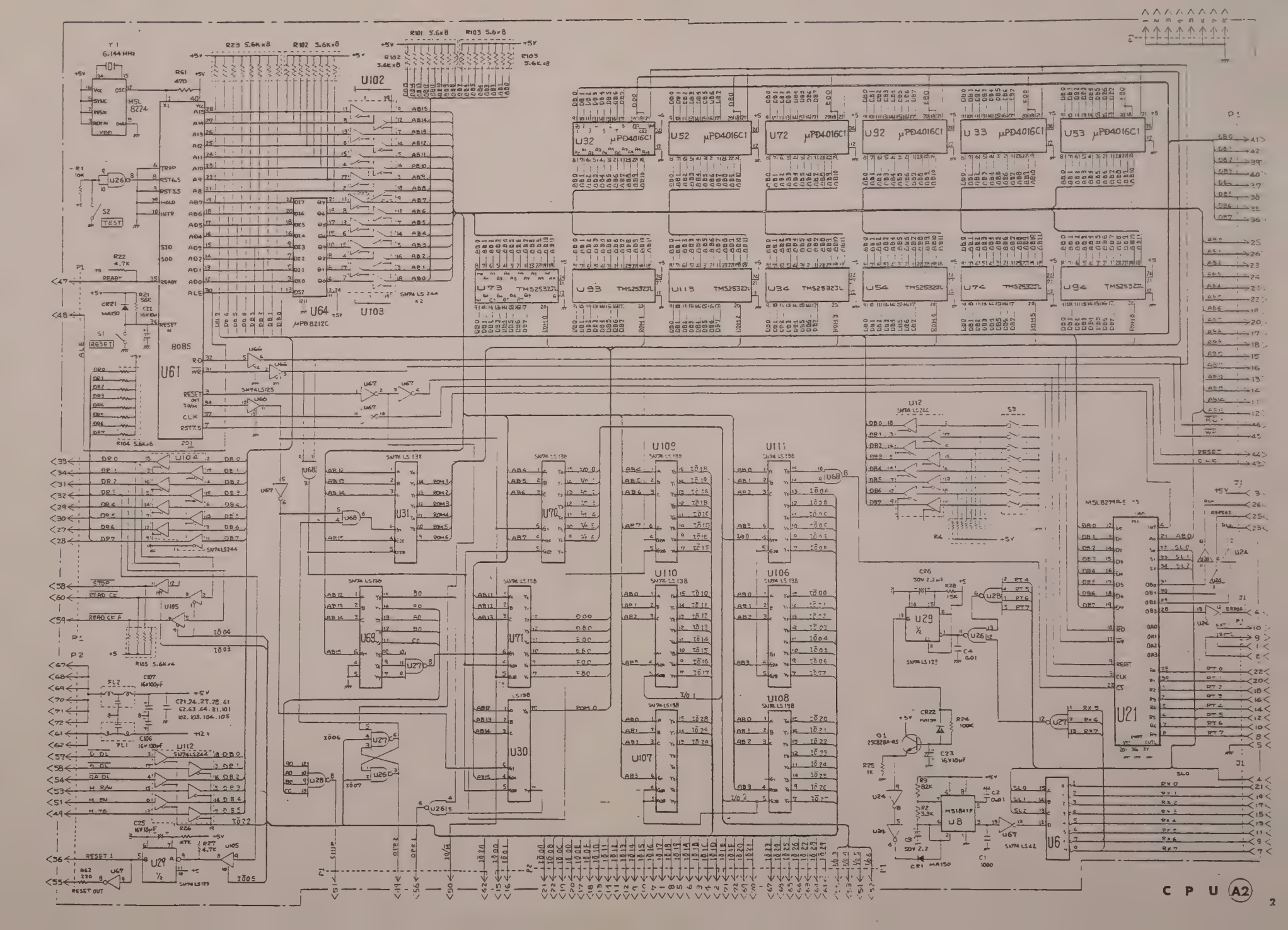
▷ POWER RATINGS AND RESISTANCE TOLERANCES OF FIXED RESISTORS ARE 1/8 WATTS AND ±5 % UNLESS OTHERWISE NOTED.

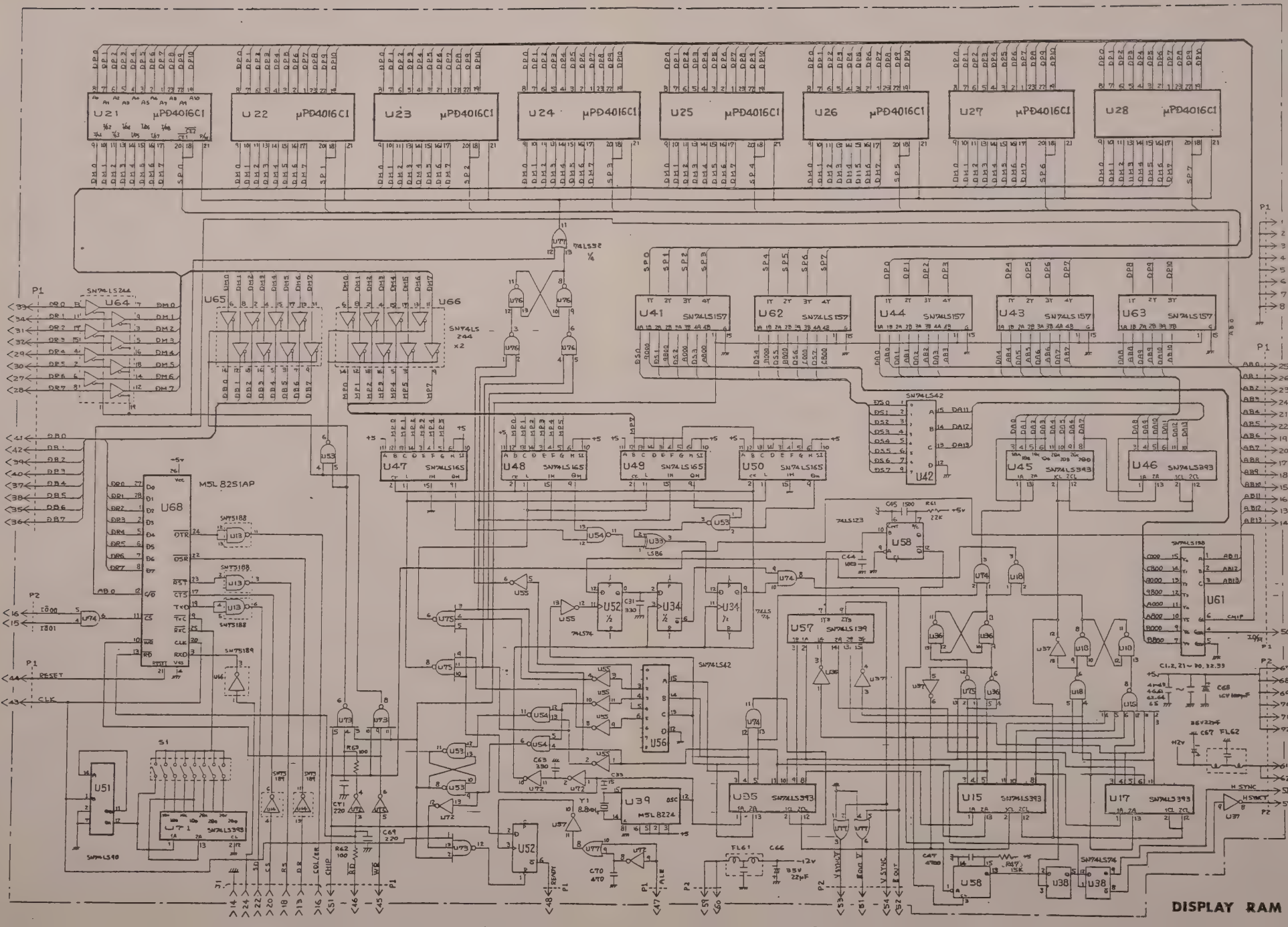
▷ ✡ FACTORY REWORKED OR CHECKED COMPONENTS.

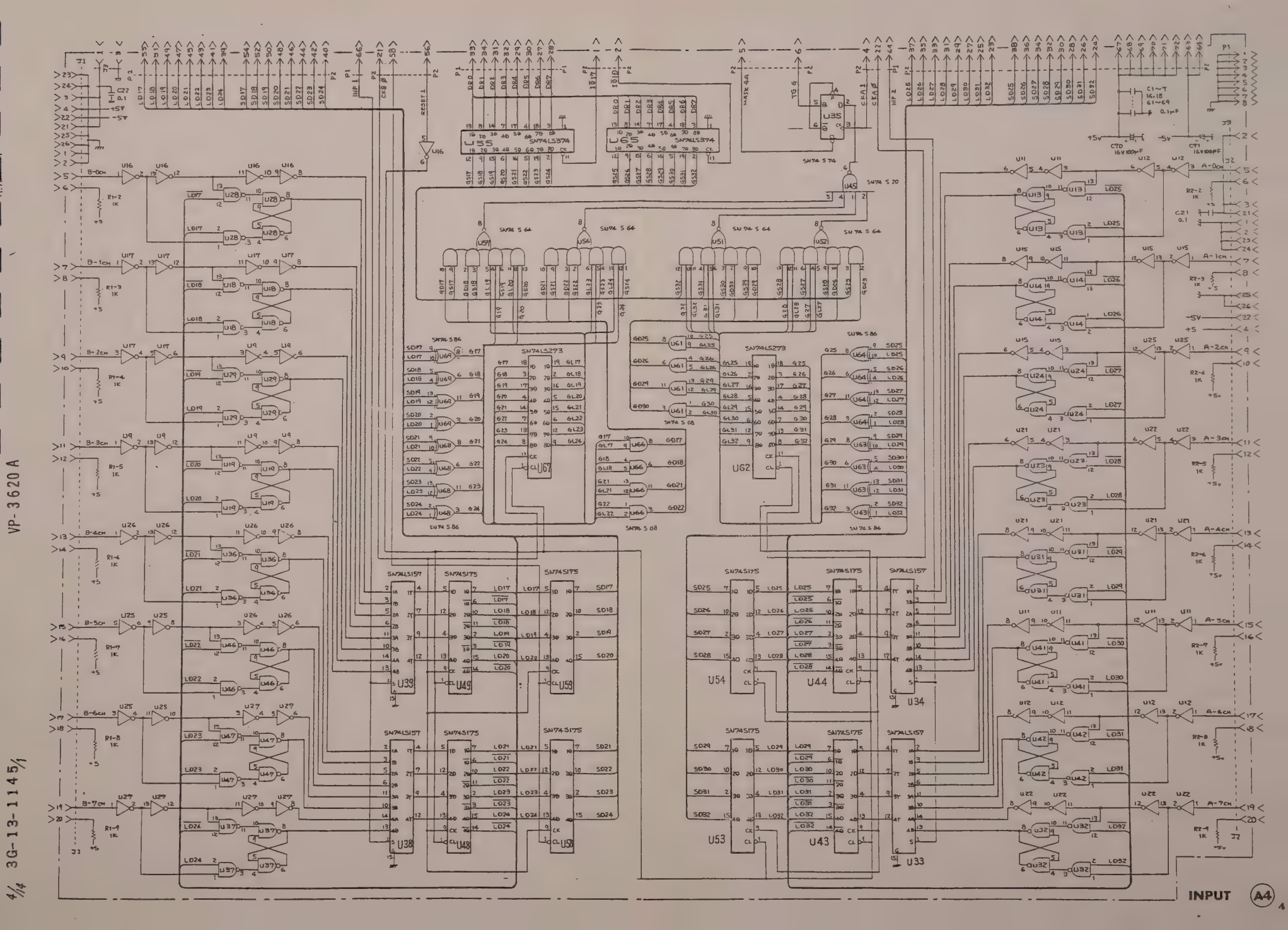
▷ ✱ VALUE SELECTED AT FACTORY, NOMINAL VALUE SHOWN.



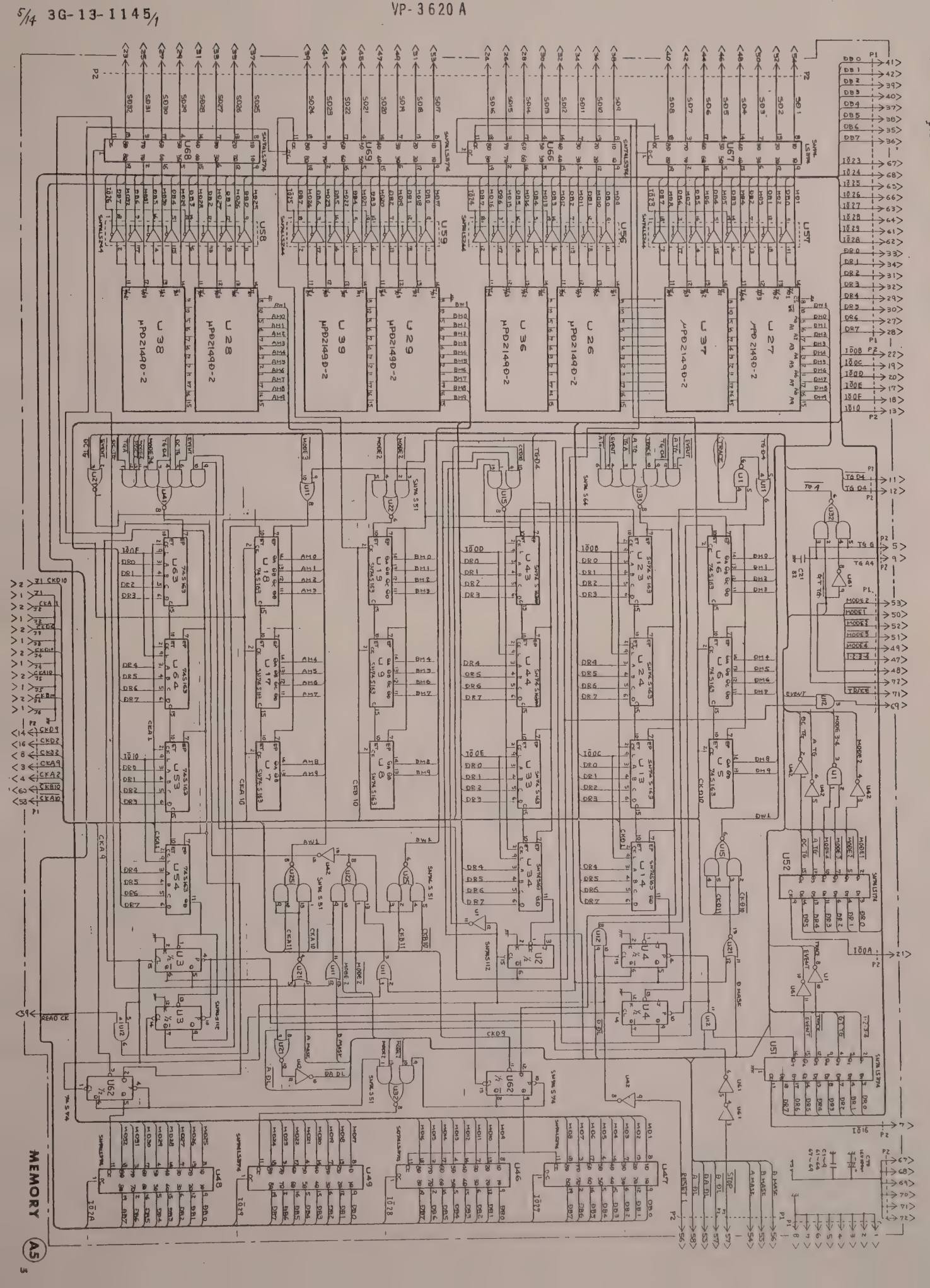
OVERALL INTERCONNECTION (A1)

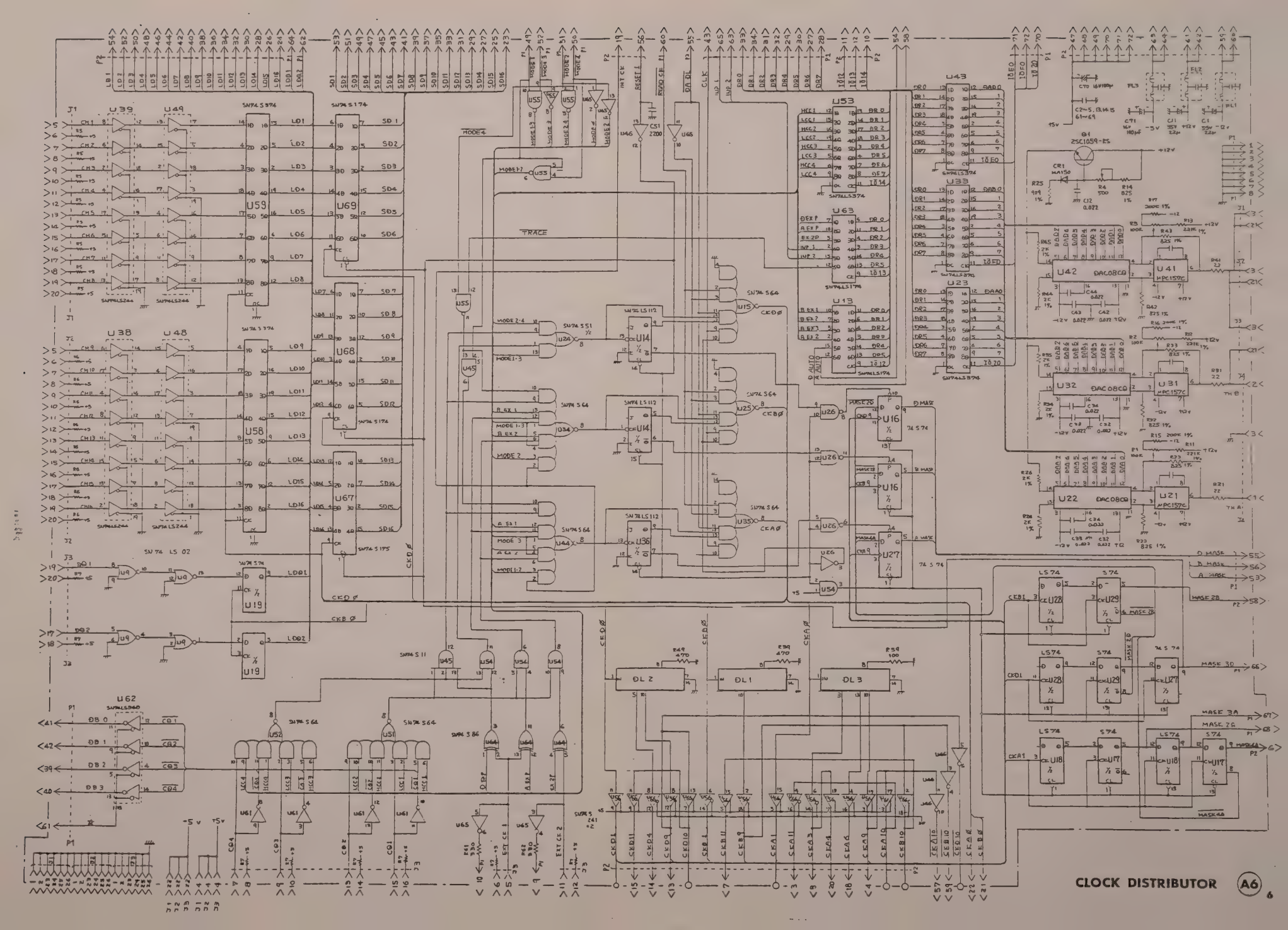

CPU A2
2

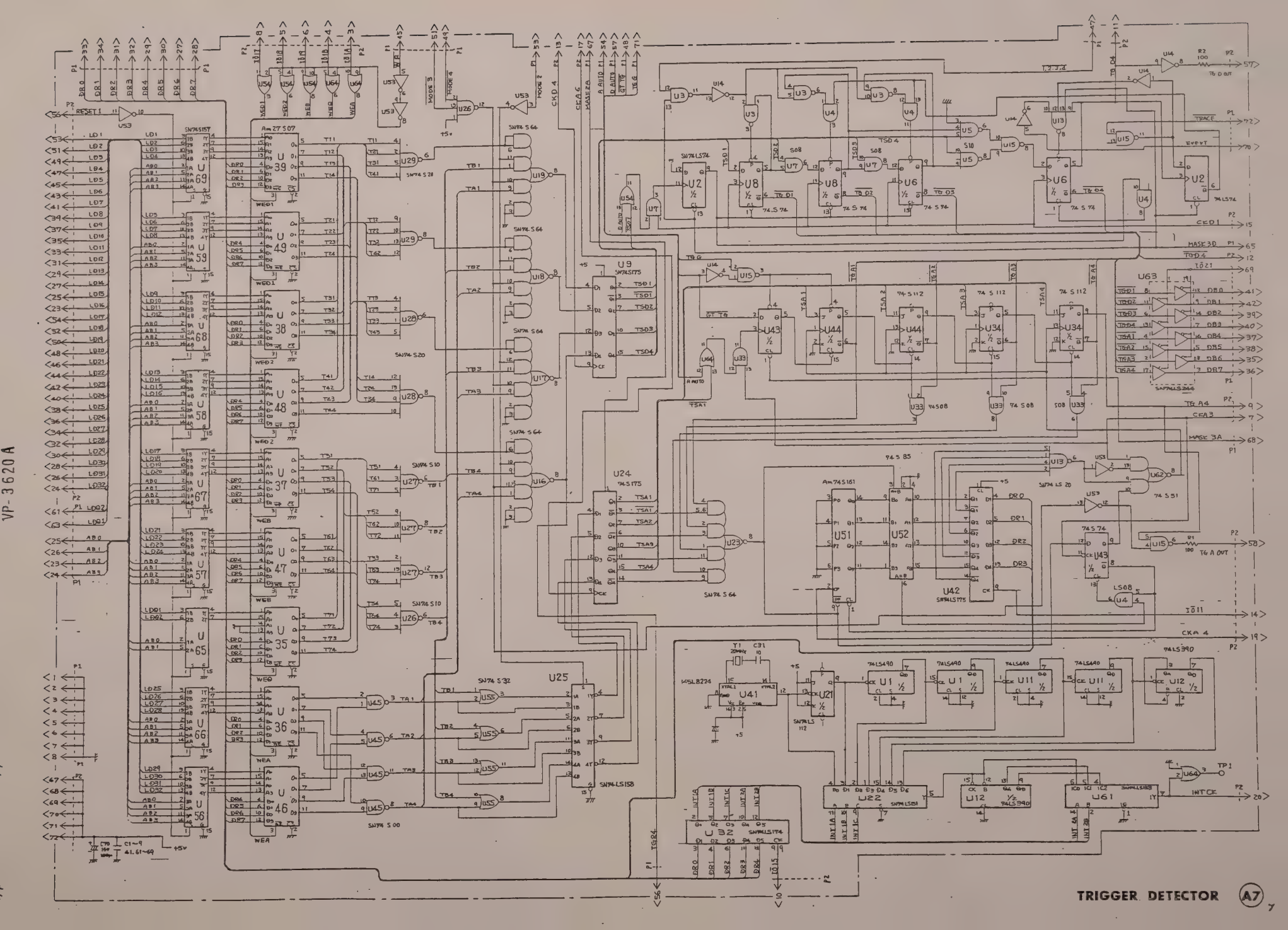

U21 μPD4016C1
U22 μPD4016C1
U23 μPD4016C1
U24 μPD4016C1
U25 μPD4016C1
U26 μPD4016C1
U27 μPD4016C1
U28 μPD4016C1
U41 SN74LS157
U62 SN74LS157
U44 SN74LS157
U43 SN74LS157
U63 SN74LS157
U64 SN74LS244
U65
U66
SN74LS 244 x2
U68 M5L8251AP
U47 SN74LS165
U48 SN74LS165
U49 SN74LS165
U50 SN74LS165
U42 SN74LS42
U45 SN74LS393
U46 SN74LS393
U61
U57 SN74LS139
U56 SN74LS42
U39 M5L8224
U35 SN74LS393
U15 SN74LS393
U17 SN74LS393
U71 SN74LS393
U58 74LS123
U38 SN74LS74
U51
S1
RESET
CLK
P1
P2
DISPLAY RAM (A3)
VP-3620A
3/4 3G-13-1145/1

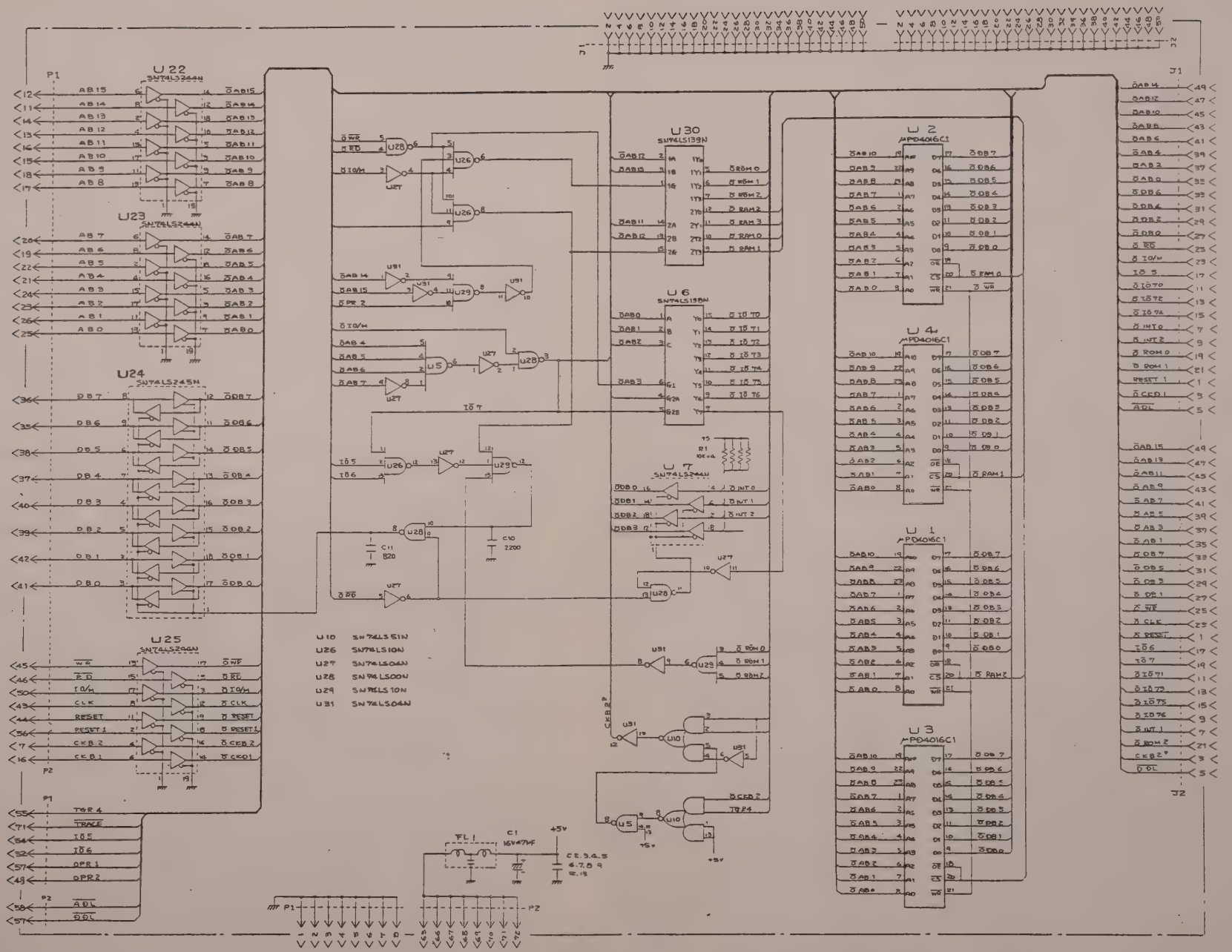

VP-3620A
4/4 3G-13-1145/1
INPUT
A4

VP-3620A




CLOCK DISTRIBUTOR
A6
6


TRIGGER DETECTOR
A7
VP-3620A

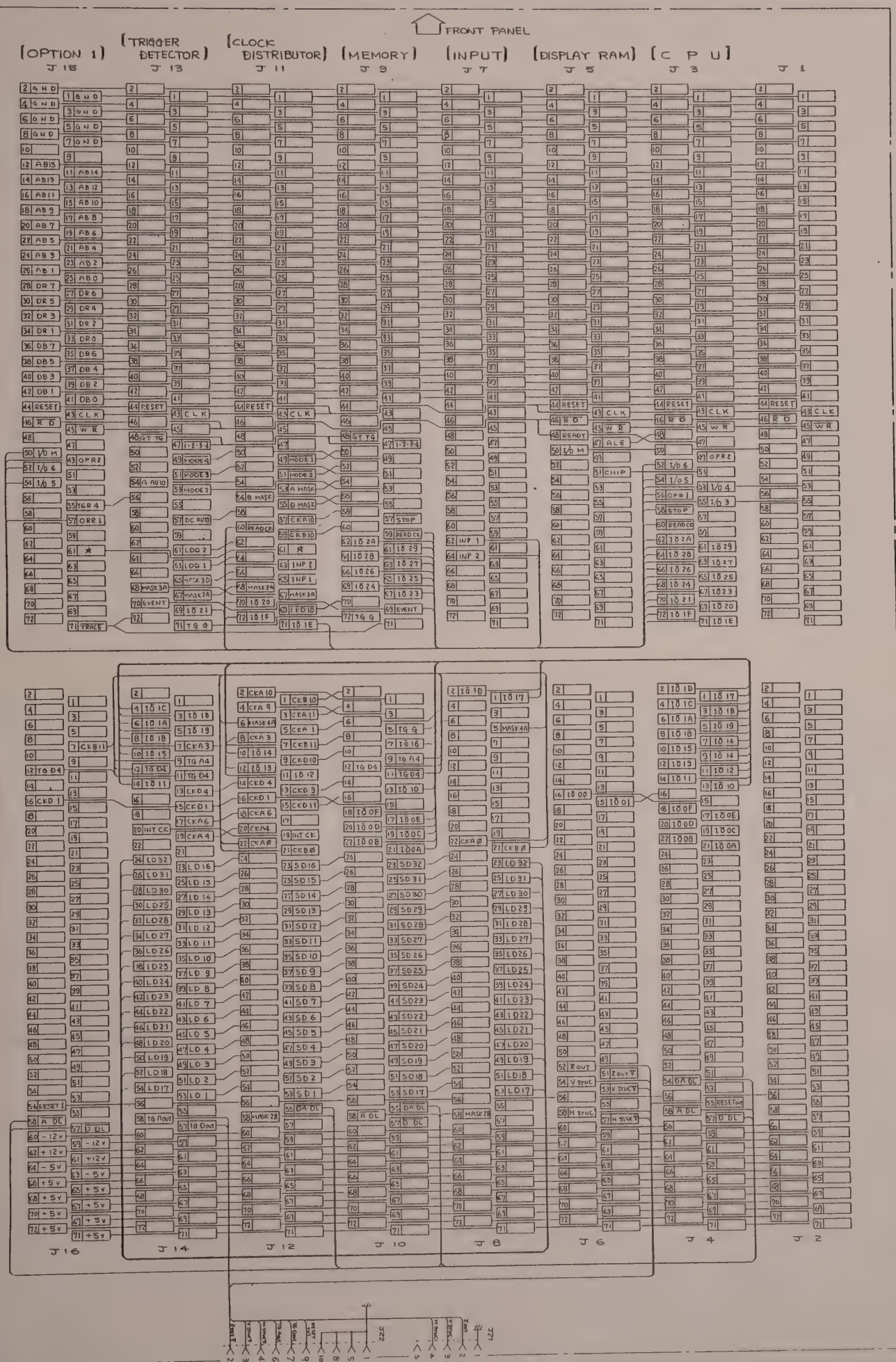

U22
SN74LS244N
U23
SN74LS244N
U24
SN74LS245N
U25
SN74LS240N
U30
SN74LS139N
U6
SN74LS139N
U7
SN74LS244N
U2
μPD4016C1
U4
μPD4016C1
U1
μPD4016C1
U3
μPD4016C1
U10 SN74LS51N
U26 SN74LS10N
U27 SN74LS04N
U28 SN74LS00N
U29 SN74LS10N
U31 SN74LS04N
P1
P2
J1
J2

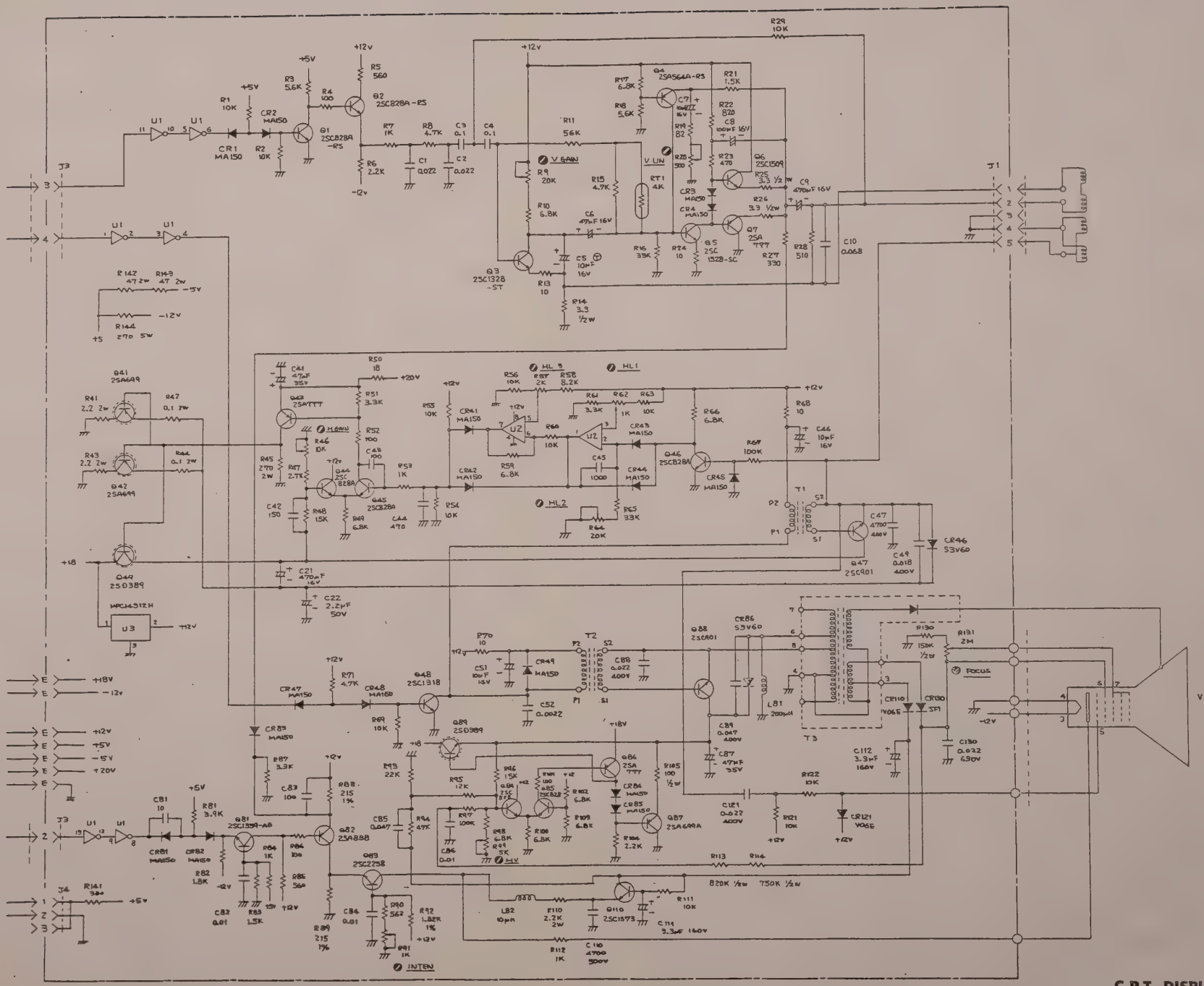
OPTION 1 (A8)

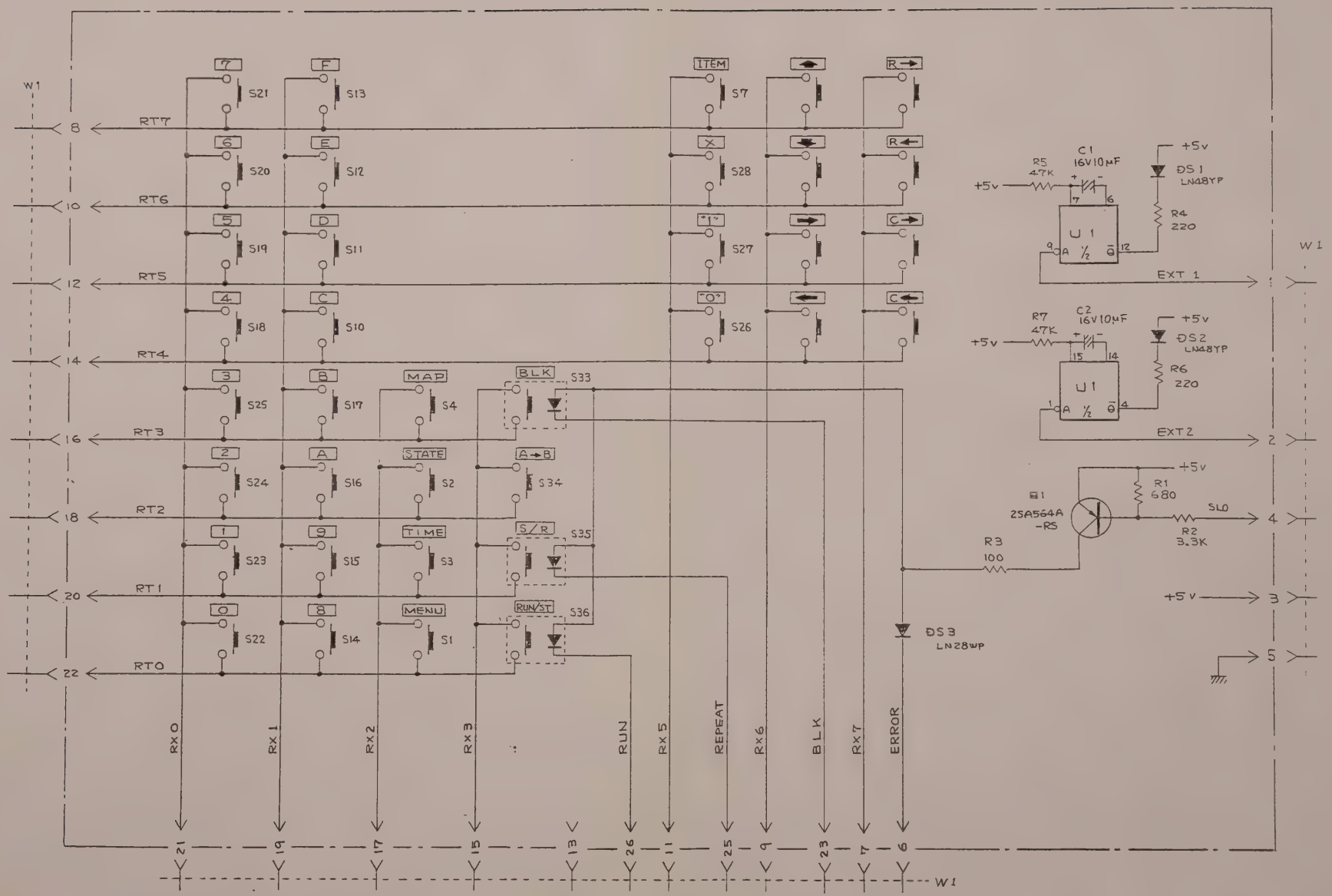
9/14 3G-13-1145/1

VP-3620A

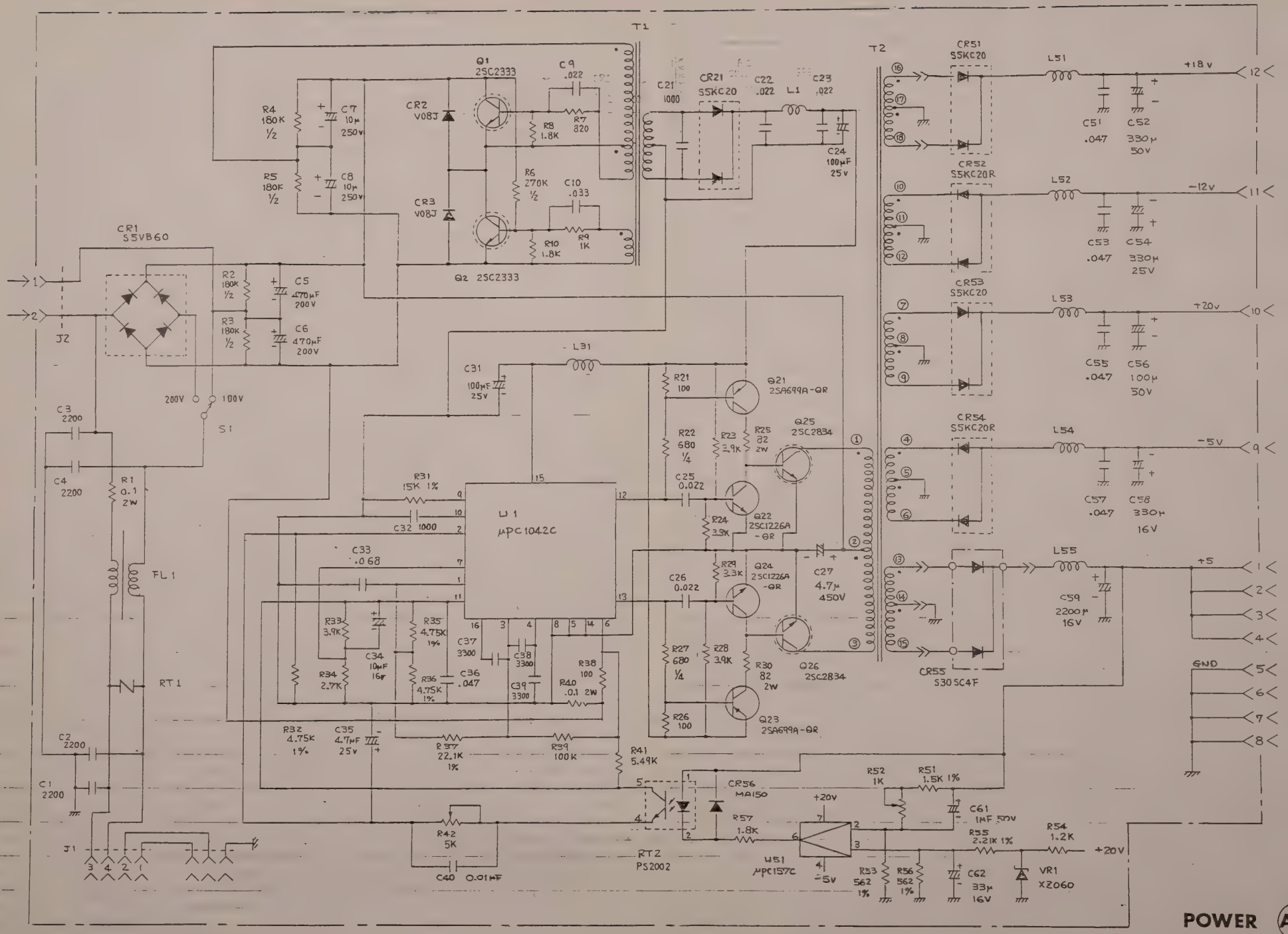
H. HARADA



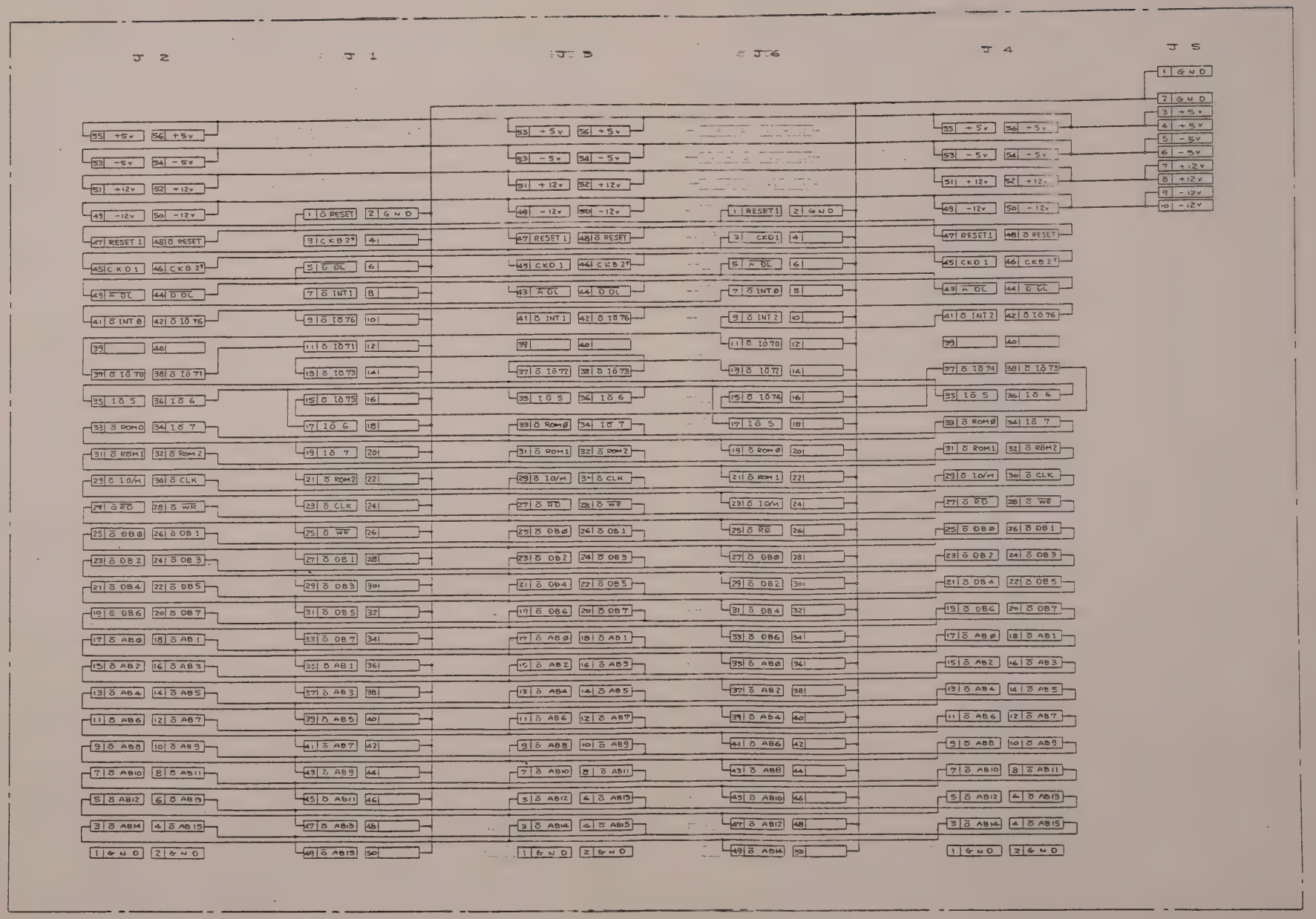

CRT DISPLAY
A10
VP-3620A
8G-13-1145/1
10/4



KEY BOARD A11


T1
T2
Q1 2SC2333
Q2 2SC2333
CR1 S5VB60
CR2 V08J
CR3 V08J
CR21 S5KC20
CR51 S5KC20
CR52 S5KC20R
CR53 S5KC20
CR54 S5KC20R
CR55 S30SC4F
CR56 MA150
L31
L51
L52
L53
L54
L55
L1
U1 μPC1042C
Q21 2SA699A-QR
Q22 2SC1226A-QR
Q23 2SA699A-QR
Q24 2SC1226A-QR
Q25 2SC2834
Q26 2SC2834
U51 μPC157C
RT1
RT2 PS2002
VR1 XZ060
S1
J1
J2
200V
100V
+18V
-12V
+20V
-5V
+5
GND

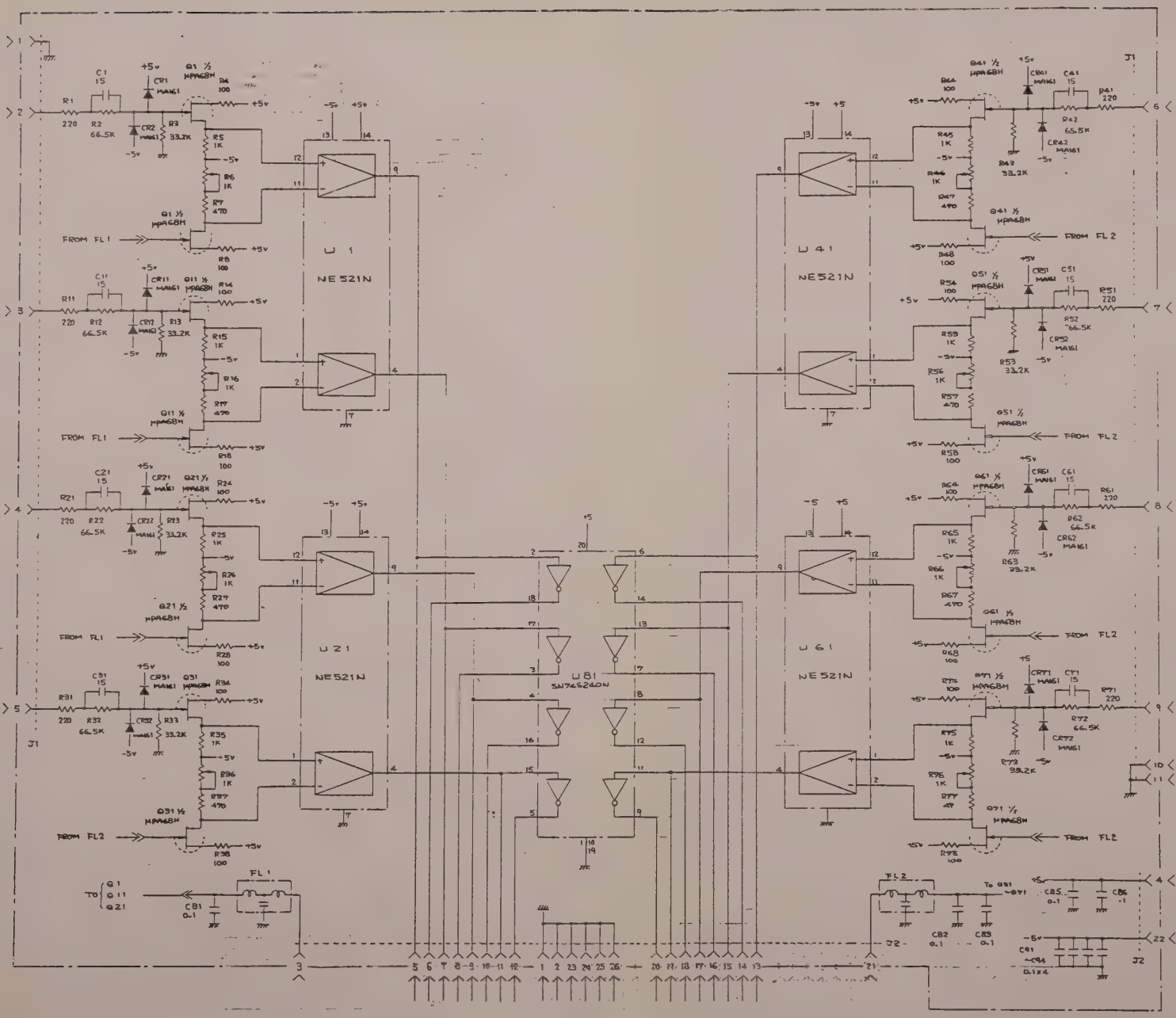
POWER A12



H. HARADA

VP-3620A

1/4 3G-13-1145/1


U1
NE521N
U21
NE521N
U41
NE521N
U61
NE521N
U81
SN74S240N
FROM FL1
FROM FL2
TO Q1 Q11 Q21
TO Q81 Q71
FL1
FL2
J1
J2

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